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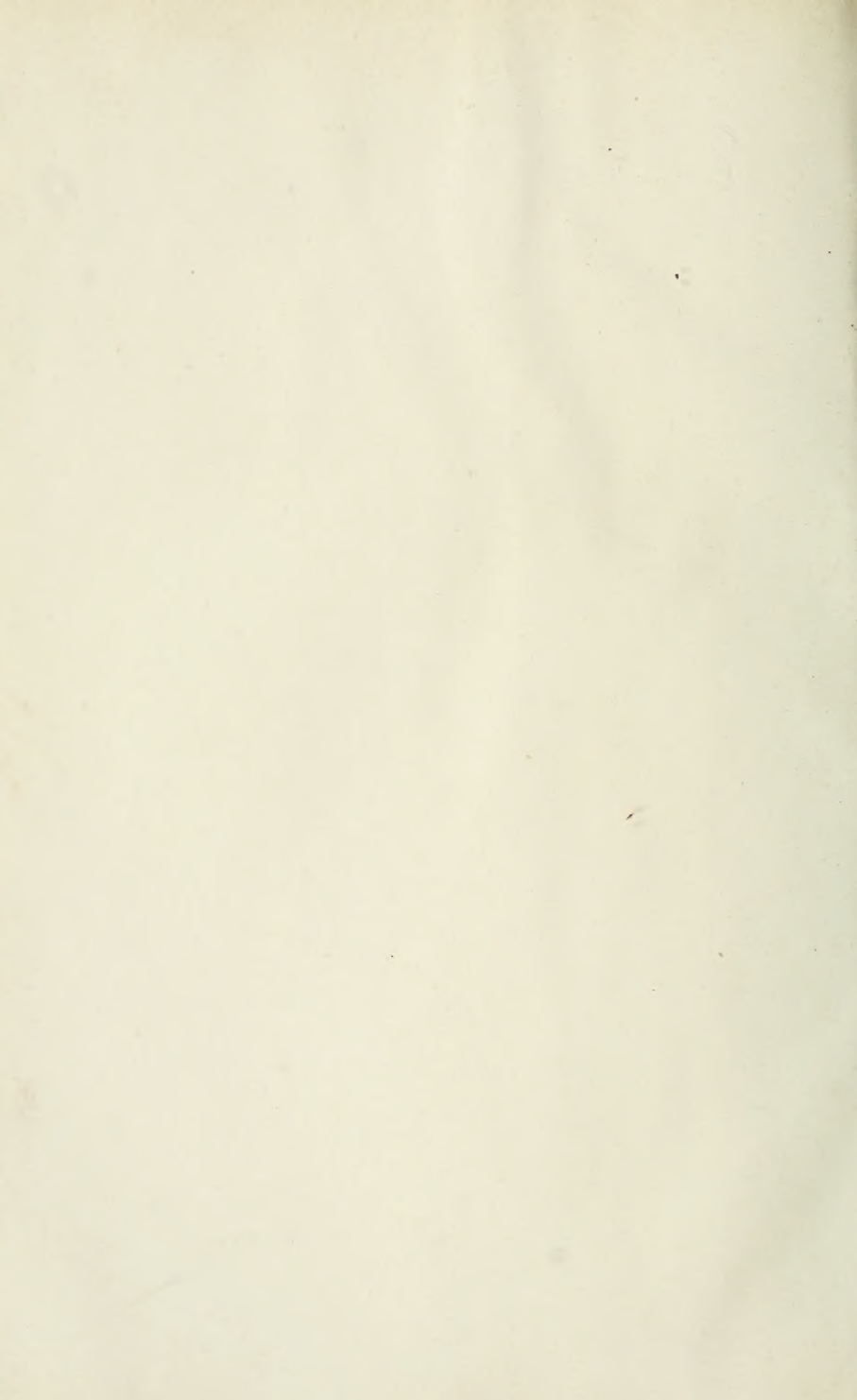
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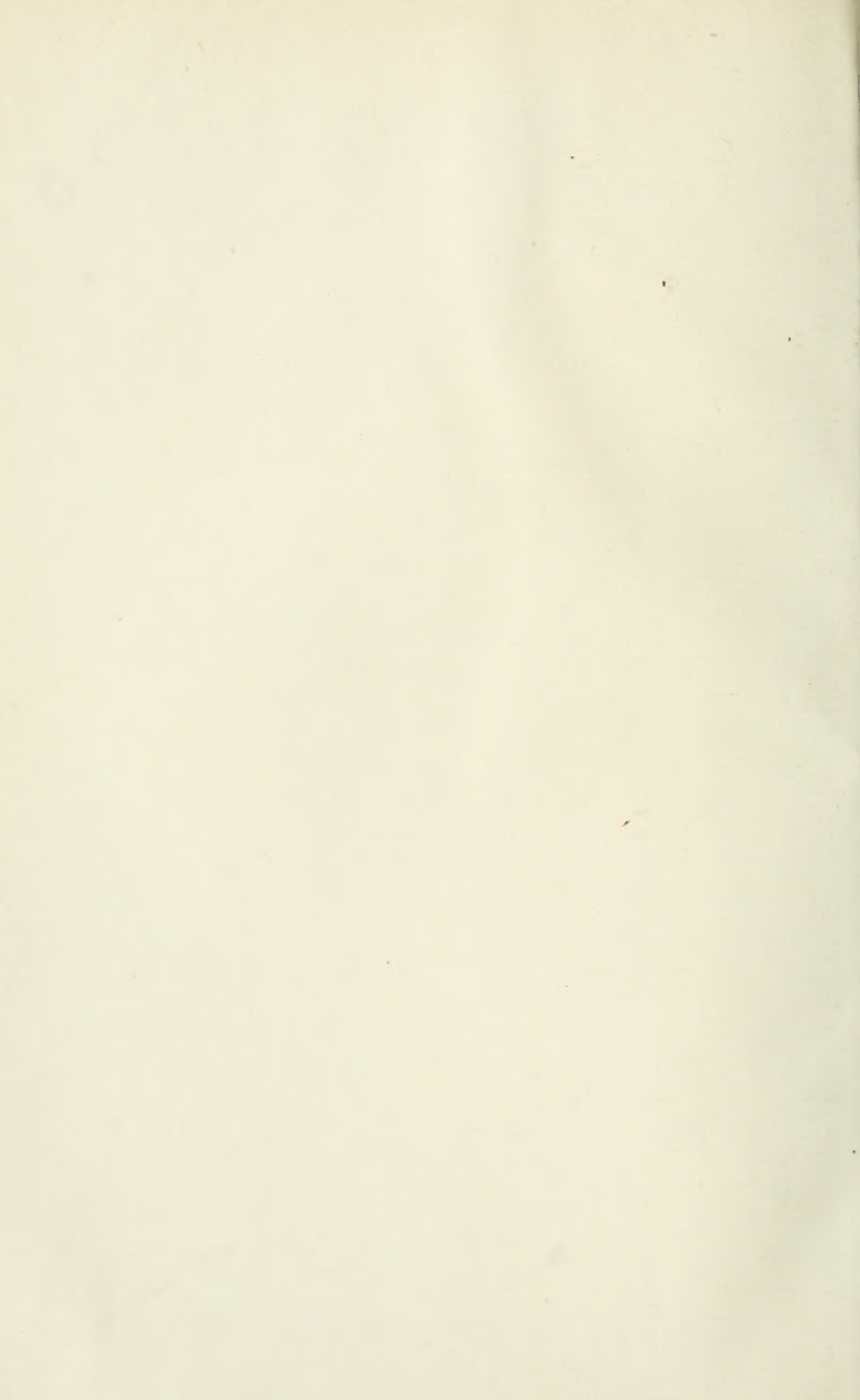














# EDINBURGH MEDICAL JOURNAL

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EDINBURGH



# EDINBURGH MEDICAL JOURNAL

WITH WHICH IS INCORPORATED

## The Scottish Medical and Surgical Journal

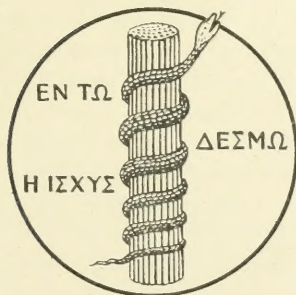
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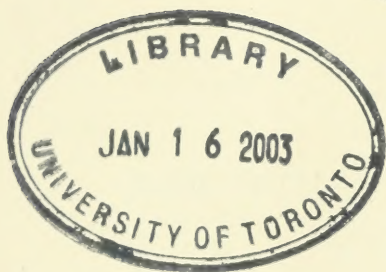
*VOL. VI*



*Printed and Published for the Proprietors by*

WILLIAM GREEN & SONS  
EDINBURGH AND LONDON

1911





# EDINBURGH MEDICAL JOURNAL.

## EDITORIAL NOTES AND NEWS.

### Colonel Warburton's Resignation.

MEN well advanced in middle age can only remember three superintendents of the Royal Infirmary—Mr. Fasson, General Lithgow, and Colonel Warburton—and to the last of these we shall soon have to say farewell. Mr. Fasson and General Lithgow died in harness, and now, after holding office for eleven years, Colonel Warburton has resigned.

It is characteristic of the age we live in that there is an increasing tendency for men to give up work when they are still, to all appearance, as capable as ever of continuing, and in this connection we recall the words of Professor Ogston when he resigned his chair—"I resign, gentlemen, not because I feel myself incapable for the work, but because I dread the advent of the day when I shall no longer recognise my incapacity." It is much better that people should say—"Why did he resign?" than—"Why didn't he do it sooner?"

The former question will certainly be asked in Colonel Warburton's case. His relations with the staff have always been most cordial, and he has filled a difficult post with much success. It is no easy task to superintend the Royal Infirmary of Edinburgh. The superintendent must keep a firm hand on the purse-strings, and yet must be ready to spend liberally on necessary advances. He has to control the more imperious members of the staff, and see that the no less deserving, but less insistent ones, get fair play. He has to take part in all those numerous conferences at which hospital administration, hospital abuse, nursing legislation, and such like vexed questions are keenly discussed, and in each of them he has to tread a narrow and thorny path. All these duties Colonel Warburton has faithfully and conscientiously discharged, and all who have been brought into contact with him will wish him well in his well-earned leisure.

It now falls to the managers to look for a successor, and in some respects their task is a heavier one than fell to their predecessors. The Infirmary has grown enormously, and the superintendent is the administrator and controller of a population exceeding that of several of Scotland's Royal Burghs. He has to supervise and check the expenditure of an enormous amount of money; he has to keep the

peace between the managers and the staff; and he has—some say the most difficult task of all—to control the cheerful spirits of the Residency.

In the past most of the applicants have been men nearing the conclusion of a career in one or other of the Services, whose experience in administration had been greater than usually falls to the lot of medical men. In the future it seems not unlikely that hospital administration will develop into a new medical specialty, and that men will devote themselves to it comparatively early in their career, and it seems possible, even probable, that, in the inevitable changes of the poor law, the head of the poor law infirmaries will be a medical man with administrative as well as medical control.

But we are in the meantime concerned neither with the past nor the future, but with the present, and it seems to us that if the managers could only secure the services of some well-known medical man of proven administrative capacity who was familiar with the special problems of the Royal Infirmary, they would be wise.

The late Dr. Colin  
Mackenzie.

It is with much regret that we record the death of Dr. Colin Mackenzie of Trinity, who in the latter part of November was struck down

with an attack of enteric fever to which he succumbed on the 4th of December.

A native of Ross-shire, Dr. Mackenzie was educated in Edinburgh, where he graduated M.B., C.M., in 1877, and subsequently obtained the Diploma in Public Health of the Royal College of Surgeons. After acting as house-surgeon in Leith Hospital, and as assistant to his kinsman the late Dr. Donald Murray of Leith, he went to Tain, where he practised for a number of years. In 1896 he came to Trinity, and soon built up an excellent practice in that district. To his patients he was always a kind friend as well as a skilful doctor, and their constant devotion to him reflected their appreciation of his interest in their welfare.

Although of a quiet and retiring disposition, Dr. Mackenzie had many interests in life beyond those which were purely professional. A genuine all-round sportsman, a Volunteer of many years' standing, and an enthusiastic Freemason, he had a wide circle of personal friends by whom his loss is keenly felt. He leaves a widow, a son, and a daughter, to whom we tender our sincere sympathy.

The Crisis in the  
Medical Profession.

SUCH is the slightly shortened title of an address recently delivered before the South Wales and Monmouthshire Branch of the British Medical Association by Mr. Smith Whitaker, the medical and organising



secretary of the Association. Unfortunately it appears in the supplement to the *Journal* (10th December). We say unfortunately because we know that many make it almost a point of honour to consign the supplement to the waste-paper basket unread, and Mr. Whitaker's is an admirable address—clear, temperate, and fair. Whether we agree with the use of the word crisis or not, it is evident and has been evident for some time to those who look forward, that changes in certain, if not in all, branches of medical practice are inevitable. Whether we like it or not, whether the present Government continues in power or the Opposition takes its place, whether the report of the majority of the Poor Law Commission is adopted or that of the minority, the fact remains that the leaders of public opinion on both sides are convinced that sickness and invalidity are at the bottom of the questions of destitution and unemployment, and that in the prevention and early cure lie their solution.

In Mr. Whitaker's calm and unbiassed review of the situation, those who have not begun to realise that there is a crisis, as well as those who regard some of the proposals as "the end of all things," will find much information and some comfort.

**The Scottish Otological  
and Laryngological  
Society.**

FOR some time past a feeling has been growing amongst those members of the profession resident in Scotland who are specially interested in the study of diseases of the ear and throat that more opportunities should be given to them for the purpose of discussion.

It is often difficult and sometimes impossible for Scottish members to attend the sectional meetings of the Royal Society of Medicine in London, and as the business at the sections of Laryngology and Otology consists mainly in the exhibition of patients—a programme which distance and expense naturally prevented Scottish members from taking any active part in—it was finally decided that a Scottish Society should be formed, in no sense, however, inimical to the interests of the London sections. In that way discussions could be held, papers read, and patients shown, and the members of the profession resident in Scotland would thus have an opportunity of meeting each other and exchanging views.

With the growing importance of this branch of medicine and surgery, and its inclusion in the teaching programme of the medical schools, there has naturally been an increase in the number of men interested in the specialty. As a result of this, the new Society has commenced with a membership of twenty-eight, sufficient to allow of the meetings being well attended. Those who are eligible for membership must hold a University, Hospital, or Dispensary appointment in this special branch of medicine.

It is proposed to carry on the Society in as simple a way as possible,

unhampered by laws and by-laws. A chairman will be elected to preside at each meeting, while the business of summoning the meetings and arranging its transactions for publication will be in the hands of a secretary and treasurer. Dr. W. S. Syme, Glasgow, has been elected to this office.

The Society will meet from time to time in Edinburgh, Glasgow, Aberdeen, and Dundee. The first meeting of the Society was held in the Ear and Throat Department, Royal Infirmary, Edinburgh, on Friday, 11th November 1910, under the chairmanship of Dr. A. Logan Turner. Twenty-four members were present, and a very successful meeting was carried through. Cases were shown by Drs. Logan Turner, Malcolm Farquharson, J. S. Fraser, J. D. Lithgow, and W. G. Porter. In the evening the Society dined together at the Caledonian Station Hotel. It was arranged that the next meeting should be held in Glasgow, in May 1911, with Dr. Thomas Barr as chairman.

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**Appointments.** ON the expiry of his term of service as Physician to Leith Hospital, Dr. H. G. Langwill has been appointed a Consulting Physician. Dr. Edwin Matthew has been appointed Physician to the Hospital.

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EPITHELIOMA OF THE TONGUE—A REVIEW OF SIXTY HOSPITAL CASES.<sup>1</sup>

By F. M. CAIRD,

Regius Professor of Clinical Surgery, Edinburgh.

THERE are sites in the human body wherein carcinoma assumes a specially intractable character, and where the most far-reaching efforts of the surgeon to attain a radical cure are extremely disappointing in their results. We may contrast in this respect the larynx and the tongue, the sigmoid flexure of the colon and the rectum. Carcinoma of the larynx confined within a cartilaginous box, and carcinoma of the sigmoid flexure enveloped by its protecting envelope of peritoneum, resemble each other in so far that a relatively favourable prognosis can be given as to the ultimate result of operation, while, on the other hand, carcinoma of the tongue and carcinoma of the rectum are alike more uncertain as to the ultimate issue of surgical intervention. In the latter sites the anatomical relations of the muscular planes involved, the free lymphatic connections, and the lack of a good defensive environment all favour rapid dissemination of the disease. It is notorious that our treatment of lingual carcinoma, frequent as the malady is, easily recognised, and that, too, at an early date, cannot be said, as yet, to rank amongst the brilliant triumphs of surgery.

On this account a review of sixty cases under our care during the last ten years in the Royal Infirmary may prove instructive. The list appreciably loses in value from the somewhat meagre nature of some of the clinical records and from the difficulty experienced in tracing the after-history of cases drawn from a floating population, but it at least represents an individual experience. Speaking generally, the disease is peculiar to the male sex, rarely attacking women. It begins as a local induration, or a hard elevated area, on the lateral border of the tongue, where there may already exist a crack or fissure. The covering epithelium gives way, an ulcer forms, and a most characteristic pain, referred to the ear and to the temporal region, annoys the patient, so that he frequently appears with cotton-wool plugging the ear. Enlargement of the lymphatic cervical glands speedily

<sup>1</sup> A communication to the Edinburgh Medico-Chirurgical Society, November 1910.

ensues. If the trouble be situated near the root of the tongue, or if it spread to the floor of the mouth, the greater is the inconvenience felt by the patient in the form of discomfort or pain when chewing, swallowing, and speaking. There may be a copious flow of saliva, and the breath acquires an offensive odour. Difficulty in protruding the tongue is experienced, according to the fixation and involvement of the organ.

*Antecedent irritation* has long been recognised as at least predisposing to the development of carcinoma. The laity are prone to cite local irritation of some kind, chiefly that from carious or jagged teeth, as the main source of this malady.

Of our sixty cases twenty-seven ascribed the disease to this cause, although one patient was convinced that induration appeared prior to the dental irritation; eighteen already had the offending tooth extracted, and thereby thought some amelioration of pain ensued; four had the projecting angles of the tooth filed smooth; seven came with the offending tooth *in situ*; three blamed a badly-fitting artificial denture; two were satisfied that the malignant ulcer arose at a point facing that where they held the tobacco pipe; three had made a rather prolonged use of caustics for apparently simple conditions; and one had scalded her mouth with porridge eight weeks before the epithelioma developed. Thus thirty-eight gave a definite account of an antecedent local irritation.

*Tobacco* has been branded as a possible factor. Amongst the fifty-four male cases it is interesting to find that no one is chronicled as a non-smoker. The pipe was used by twenty in moderation, eleven to excess (over two and a half ounces a week); details are lacking as to the others. The habit of smoking was abandoned as the disease advanced. One patient occasionally obtained relief by smoking, but as frequently the reverse.

In regard to *alcohol* three patients were total abstainers, fourteen drank to excess, eight in moderation, and of fifteen there is no definite information.

*Syphilis*.—In no patient were syphilitic manifestations discovered, and only four males acknowledged infection.

*Leucoplakia* is only noted three times as occurring on the tongue and cheeks.

Nineteen patients could give no history of any antecedent irritation, two were edentulous, and one, a Highlander, 70 years of age, had a perfectly sound set of teeth.

A *hereditary history of carcinoma* was elicited from five

patients. On the paternal side a death from cancer of the stomach; on the maternal, two cases of mammary cancer, one of the œsophagus, and one of the pelvic organs.

Of the six females three blamed jagged teeth, one irritation from a tooth-plate, and one, as already stated, had scalded her tongue with porridge.

A consideration of the above points tends to confirm us in the relationship which obtains between antecedent irritation and malignant disease. It also urges us to enter a plea for the same care of the teeth in the later years of adult life that has been so strongly advocated in early youth. One would emphasise the apprehension with which the surgeon views the supposed "tooth-aches and earaches" of mature years, and we would draw the attention of the dentist to the importance of investigating the state of the tongue in such patients.

The question of diagnosis need not detain us. It rarely presents any difficulty, and microscopic examination is so easily carried out that it should be routine in every case to confirm an opinion or to clear up a doubt. For this purpose the ulcerated area is cleansed, and a small portion is snipped from out the base of the ulcer, remote from its epithelial edge. This is teased out and stained with picro-carmin, or it may be more satisfactorily investigated by cutting in series with a microtome. The latter method is needful in doubtful cases. Few pathological conditions are so clearly revealed, and give such a positive result on microscopic examination. On two occasions only have we failed to obtain a definite result. Curiously enough both patients were females. The first of the two may have had a sarcoma. The histories are as follows:—

I. Miss A. H., æt. 60, for the last eighteen months has had enlarged lymphatic glands on the right side of the neck. Four months ago she caught cold, the glands increased in size, and her tongue became swollen towards the back. Her false teeth now rubbed on the tongue, caused a slight abrasion, so she removed them. A growth next appeared at the irritated site, steadily increased, and occupied the greater part of the right side of the tongue. It rose from a broad base above the level of the dorsum, was covered with a yellowish exudate, and was of firm but not indurated consistence. The lymphatic glands on each side of the neck were firm, mobile and tender. Latterly she experienced pain on the right side of the face. The pathologist reported that the part removed for examination consisted almost wholly of



granulation tissue, there was nothing distinctly epithelial to be made out. Notwithstanding this it was thought right to remove the affected half of the tongue. The glands thereafter subsided, and the patient made an excellent recovery. We learned that the patient died five months after from fungating cervical glands.

II. Mrs. W., *æt.* 39. Since her fifteenth year she has been unable to swallow properly. She has also been subject to sore places on the left side of the tongue and cheek, the mucosa becoming red, ulcerating, and again rapidly healing. For the last three months the left side of her tongue has been painful, as also the side of the neck and face. The tongue showed a superficial glossitis on the left side, and somewhat remote posteriorly a thickened epithelial patch, not ulcerated nor hard. On two occasions pieces of tissue removed from this were free from any evidence of epithelioma. The patient was therefore sent home with instructions to use a mouth wash, and to report progress. She returned after six months. There was now advanced epithelioma of tongue and glands, confirmed at once on microscopic examination, and the condition was inoperable.

Even if we admit a single error in regard to the microscopic features, as revealed in the first examination of the above case, it in no way detracts from the great practical value of such a method of investigation, a method so trustworthy and important that we cannot afford to dispense with its use in any case.

The only treatment for lingual carcinoma which at present holds out prospect of hope is that by the knife. No other is of any avail. The so-called radical measures generally constitute a two-stage operation. We are indebted to Mr. Butlin, who brought our operative procedure into line with those practised in other regions of the body when he advocated a systematic attack upon the adjacent lymphatic areas. The first part consists in removal of the half or the whole tongue after the manner of Whitehead or of Syme. The second, about ten days after, is Butlin's dissection of the side of the neck affected, from the angle of the jaw to the sterno-clavicular articulation, and requires complete removal of the connective tissue exposed, including the platysma, lymphatics, submaxillary, and portions of the parotid salivary glands, and even portions of the internal jugular vein, &c., if need be. Such sweeping measures are accompanied by a remarkably low mortality, so low, indeed, that, despite uncertainty as to the ultimate result, we are justified in urging operation. The chances of a cure are not, indeed, so probable as those which

follow upon pylorotomy for gastric carcinoma, but the risk incurred is not nearly so great. Apart from the usual surgical precautions, the vascularity of the regions involved and the opportunities for free drainage diminish the danger. Moreover, local recurrence in the mouth is comparatively seldom. The patient's life is prolonged, and he is spared, at but small danger, the misery and suffering associated with a foul, painful mass in the mouth, and the frequent glandular return of the disease in the neck is a less trying termination to life. Hence partial operations in which the primary lingual disease alone is removed, and the secondary glandular implication is left untouched, may be perfectly justifiable and, indeed, welcome.

Certain circumstances lead to modifications in the method of operation. For several years we have been accustomed to perform the first stage of the operation under local anaesthesia, and, we have reason to believe, with great advantage. The patient's mouth having been duly prepared, he lies on the table, and the tip of the tongue is infiltrated with a half per cent. solution of cocain to which a few drops of adrenalin have been added. Two stout silk loops are then carried through the tongue on each side of the mid-line half an inch from the tip; the tongue is pulled forward, and its frenum, the mid-line, the lateral and basal attachments are freely infiltrated with the solution. Within five minutes the operation of Whitehead may be performed with knife or scissors in an easy fashion, for, thanks to the infiltration, connective tissue planes are opened up, anatomical details and the vessels are rendered clearly visible. The halves of the tongue are completely under control owing to the silk loops, no gag is required, and the patient may aid the surgeon by rinsing out the mouth if required. Even in cases where the jaw has to be divided, as in Syme's operation, we may inject the solution into the periosteum, extract incisors, and sever the bone with a Gigli saw, and that in such a painless manner that the patient neither raises his hand nor makes any protest. We endeavour to remove the entire half of the organ, leaving only the geniohyoid and the mylohyoid muscles. Should the disease extend to the alveolar margin we do not remove the whole depth of the bone. A free excision, leaving the hard sclerosed lower border, thus preserving an intact mandibular arch, is of marked advantage, and the dentist can thereafter fit an excellent prosthetic apparatus if his services have been employed prior to operation. We have not found recurrence in the bar of bone so preserved. One is much impressed by the painless character and by the slight

discomfort of such an operation performed under local anaesthesia, as also by the ease with which the patient speaks and feeds immediately after. We prefer cocain to novocain in tongue cases, because of the rapidity of its action and the fact that so much of the drug escapes during operation. There is one associated disadvantage, namely, after-oozing of blood. Every bleeding point should therefore be secured. The patient, moreover, sits up at once in bed, and by making free use of the douche rapidly checks bleeding. We treat the raw surface with iodoform and boric powder, leaving it freely open, although the method of using catgut stitches to diminish the extent of the wound might further act in diminishing reactionary hæmorrhage.

It will be found that the adjuvant laryngotomy or tracheotomy, so strongly advocated by many surgeons, is quite unnecessary when local anaesthesia is employed.

The second stage of the operation requires a general anaesthetic. It is better to remove the affected portions of the tongue before the glands, otherwise it is conceivable that lymphatic spread to the other side of the neck might be favoured when the normal channels of the affected area are cut off. At this second stage the oral cavity may be opened into, and as this entails sepsis in the upper regions of the incision free drainage is essential. We have generally removed the facial artery and vein *en masse* along with the contents of the sub-maxillary triangle.

The average age of the patients was forty-nine years, the extremes being twenty-three and seventy-three. Thirteen cases were inoperable. The annexed table of forty-seven submitted to operation is in chronological order, and is therefore the more instructive. As indicated, the type of operation conforms more or less to the methods associated with the names of Syme, Whitehead and Butlin. There were seven fatal cases, all, however, exceptionally severe, requiring ablation of the entire tongue, tonsils, portions of the pharyngeal wall and full depth of the jaw: in each a general anaesthetic had been administered.

It will be noted that only sixteen patients at present survive. Ten, twelve months since operation, and one each, twenty months, twenty-four months, thirty months, thirty-one months, seven years and eight years. Fourteen died within a year after operation, and others each within sixteen, twenty-eight and thirty-six months. Eight cannot be traced.

Such results are apt to make one despond as to the prospects of a radical cure. Even in cases where the microscope did not



reveal any trace of malignancy in the lymphatic glands removed a return has taken place. However, it must be admitted that results in private practice are rather more encouraging, probably because the patients apply at an earlier date. Moreover, there is good reason to believe that the still more extensive operation in which the diseased area, including the sterno-mastoid, is removed *en bloc*, as suggested by Maitland and by Crile, will yet afford a greater measure of success.

For a list of literature see the excellent article on "Carcinoma of the Mouth and Tongue," by Collins Warren, *Annals of Surgery*, 1908.

Name, Age, Date, Duration of Disease.	Antecedent Irritation.	Anæsthetic. Operation. Parts Removed.	Microscopic Report on— 1. Tongue, 2. Glands.	Result of Operation.	Further History.
1. Mr. C. A. 73. 22/8/00. 9 months.	None.	Chloroform. Whitehead. Left half and alveolar margin of jaw.	1. Epithelioma.	R.	Hale and well 8/5/08. Not traced since.
2. Mr. G. H. 55. 19/1/01. 3 months.	None.	Chloroform. Syme. Left half and removal of glands.	1. „	R.	Died one year after.
3. Mr. J. W. 62. 21/1/01.	Tooth.	Chloroform. Whitehead. Left half.	1. „	R.	Recurrence, glands removed, 4/5/01. Not traced.
4. Mr. W. A. 63. 1/9/02.	Tooth.	Chloroform. Whitehead. Right half and glands.	1. „	R.	Died Oct. 1903.
5. Mrs. B. 23. 25/10/02. 7 weeks.	Tooth.	Chloroform. Whitehead. Right half and glands, internal jugular vein.	1. „	R.	Died within a year.
6. Mr. A. Y. 51. 7/7/03. 7 months.	Tooth.	Chloroform. Ligature lingual artery and glands. Whitehead. Right half.	1. „	R.	Died 1/4/04.
7. Mr. T. C. 44. 26/9/03. 7 weeks.	Tooth.	Chloroform. Ligature lingual artery and glands. Whitehead. Right half.	1. „ 2. Glands normal.	R.	Died 31/1/05.
8. Mrs. G. 58. 18/9/03. 4 months.	None.	Cocain and adrenalin. Whitehead. Left half.	1. Epithelioma.	R.	Good health 1910.
9. Mr. M. N. 42. 27/10/03. 2½ years.	Tooth.	Chloroform. Ligature lingual artery and glands. Whitehead. Left half.		R.	Not traced.
10. Mrs. A. H. 60. 8/1/04. 4 months.	Artificial denture.	Chloroform. Whitehead. Right half.	1. Reported as "granulation" tissue. No evidence of malignancy.	R.	Died July 1904. Cervical glands fungating.

Name, Age, Date, Duration of Disease.	Antecedent Irritation.	Anæsthetic. Operation. Parts Removed.	Microscopic Report on— 1. Tongue. 2. Glands.	Result of Operation.	Further History.
11. Mr. D. W. 54. 16/2/04. 2 years.		Chloroform. Ligature both lingual arteries, glands, entire tongue and portion of jaw.	1. Epithelioma.	D.	Died pneu- monia 4th day.
12. Mr. W. J. 52. 9/8/04. 5 months.	Teeth.	Chloroform. Ligature lingual artery and glands. Left half.	1. „	R.	Not traced.
13. Mr. J. S. 55. 22/11/04.		Chloroform. Syme. Entire tongue.	1. „	R.	Died 18/1/05.
14. Mr. J. T. 62. 8/8/04. 14 days (?).		Chloroform. White- head. Half tongue and tonsil.	1. „	R.	Died within a year.
15. Mr. J. H. 60. 16/11/04. 4 months.		Chloroform. Ligature of lingual artery and glands. White- head. Left half.	1. „	R.	8/2/06. Chloro- form. Right half tongue. 10/12/06. Left glands and in- ternal jugular vein. Died, summer 1907.
16. Mr. J. F. 63. 1/6/05. 10 weeks.		Chloroform. Ligature lingual artery and removal of glands. Right half tonsilar and palatal region.	1. „ 2. Glands affected.	R.	Not traced.
17. Mr. D. M'L. 53. 25/9/05. 5 months.		Chloroform. Ligature of lingual artery. Whitehead. Left half and portion of lower jaw.	1. Epithelioma.	R.	Not traced.
18. Mr. A. W. 59. 17/10/05. 2 months.	Teeth.	Chloroform. Ligature of lingual artery, glands. Right half, pillar of fauces, por- tion of jaw.	1. „	R.	Died 15/6/08.
19. Mr. W. D. 50. 9/9/06. 5 weeks.	From pipe.	Chloroform. Ligature of external carotid, glands. Whitehead. Left half.	1. „ 2. Glands normal.	R.	Not traced.
20. Mr. A. F. 64. 28/9/06. 5 months.	Tooth.	Chloroform. Ligature of external carotid, glands. Whitehead. Left half and tonsil.	1. Epithelioma.	R.	Died 1/6/07.
21. Mr. J. B. 61. 18/4/07. 4 months.	Teeth.	Chloroform. Ligature of lingual artery, glands. Right half and lower jaw.	1. „ 2. Glands normal.	R.	Not traced.
22. Mr. J. W. 50. 17/4/07. 1 year.	Teeth.	Chloroform. Ligature of lingual artery, glands. Right half tonsil and lower jaw.	1. Epithelioma.	D.	Died 8th day. Pneumonia, diarrhoea, suppression of urine.

Name, Age, Date, Duration of Disease.	Antecedent Irritation.	Anæsthetic. Operation. Parts Removed.	Microscopic Report on— 1. Tongue. 2. Glands.	Result of Operation.	Further History.
23. Mr. E. B. 54. 9/10/07. 3 months.	Artificial denture.	a. Cocain and adren- alin. Half. b. Chloroform. Butlin.	1. Epithelioma. 2. Glands normal.	R.	Well 1910.
24. Mr. A. D. 43. 10/12/07. 3 months.	Teeth.	Chloroform. Ligature of external carotid, glands. Right half, pharyngeal wall. Tracheotomy.	1. Epithelioma.	D.	Died 4th day.
25. Mr. T. A. 53. 10/12/07. 3 months.		a. Chloroform. Syme. Right half pillar of fauces. b. Butlin.	1. „	R.	Hale and well 1910.
26. Mr. T. F. 57. 21/1/08. 10 months.		a. Cocain and adren- alin. Right half. b. Chloroform and ether. Butlin.	1. „ 2. Glands normal.	R.	Died within a year.
27. Mr. A. T. 39. 2/3/08. 3 months.		Chloroform. Syme. Half tonsil, pillar of fauces, pharyngeal wall.	1. Epithelioma.	D.	Shock (?) No section.
28. Mr. A. C. 49. 3/4/08. 5 weeks.	Teeth.	a. Chloroform. Right half. b. Chloroform. But- lin.	1. „	R.	Died 14/5/09.
29. Mr. J. C. 40. 2/5/08. 9 months.	Teeth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. „	R.	17/10/08. Glands re- moved. 15/6/09. Glands re- moved. 12/5/10. Looks and speaks well, 3 small pain- ful nodules (?) opposite caro- tid bifurca- tion, supra- clavicular region and over sterno- mastoid.
30. Mr. J. B. W. 47. 15/6/08. 5 weeks.	Tooth.	a. Cocain and adren- alin. Syme. En- tire. b. Chloro-ether. But- lin.	1. „	D.	Sudden cardiac failure 2nd day. Com- mencing pneumonia right lung. Excessive fatty changes in organs.



Name, Age, Date, Duration of Disease.	Antecedent Irritation.	Anæsthetic. Operation. Parts Removed.	Microscopic Report on— 1. Tongue. 2. Glands.	Result of Operation.	Further History.
31. Mr. J. O. 56. 4/9/08. 2 months.	Teeth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. Epithelioma. 2. Glands in- fected.	R.	Hale and well 1910.
32. Mr. A. G. 71. 10/9/08. 6 months.		Chloroform. Entire tongue and mesial portion of jaw.	1. Epithelioma.	D.	Died 5th day. Pneumonia.
33. Mr. F. G. 57. 6/1/09. 3 months.	Tooth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. " 2. Upper glands infected, mid and lower normal.	R.	Died 14/5/09.
34. Mrs. Ross. 60. 17/1/09. 2 months.	Scald of mouth with hot porridge.	a. Cocain and adren- alin. Left half. b. Chloro-ether. But- lin.	1. Epithelioma. 2. Upper glands infected, mid and lower normal.	R.	April 1910. Seemed well till a week before death, when glands of opposite side ulcer- ated and fatal hæmorrhage followed.
35. Mr. J. W. 70. 13/3/09. 3 months.	Sharp tooth.	Cocain and adren- alin. Right half.	1. Epithelioma.	R.	Died 8/2/10.
36. Mr. J. C. 59. 8/6/09. 6 months.	Teeth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. " 2. Glands normal.	R.	Well 1910.
37. Mr. D. B. 49. 10/10/09. 8 months.	Teeth.	a. Chloroform. Right half and jaw. b. Chloro-ether. But- lin.	1. Epithelioma. 2. One large gland exten- sively affected, bad condition capsule, and infected ad- jacent area. Glands nor- mal in high carotid region and cervic neck.	R.	Well 1910.
38. Mr. A. P. 59. 24/7/09. 8 weeks.	Tooth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. Glands.	1. Epithelioma.	R.	Well 1910.
39. Mr. J. T. 47. 16/11/08. 3 months.		a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. " 2. Glands in- fected.	R.	Died 14/7/09, with symp- toms of spinal metastasis.

Name, Age, Date, Duration of Disease.	Antecedent Irritation.	Anæsthetic. Operation. Parts Removed.	Microscopic Report on - 1. Tongue. 2. Glands.	Result of Operation.	Further History.
40. Mr. W. S. 51. 3/11/09. 12 months.		a. Cocain and adren- alin. Left half. b. Chloro-ether. But- lin.	1. Epithelioma. 2. No definite infection, but suspicious area in glands from spinal accessory nerve.	R.	Very well 1910.
41. Mr. R. A. 65. 6/2/09. 5 months.	Teeth.	Chloroform. Left half tongue, portion of jaw.	1. Epithelioma.	R.	Not traced.
42. Mr. A. F. 60. 5/6/09. 2 months.		a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. „ 2. Glands normal.	R.	Well 1910.
43. Mr. P. C. 64. 12/7/09. 7 months.		a. Cocain and adren- alin. Whole tongue. b. Butlin (Mr. Dow- den).	1. Epithelioma. 2. Glands in- vaded right side, left side normal.	R.	Return glands left side of neck, re- moved 16/12/09.
44. Mr. J. M. 73. 13/11/09. 12 months.		Cocain and adrenalin. Left half.	1. Epithelioma.	R.	Not traced.
45. Mr. J. H. 70. 18/12/09. 1 month.		Cocain and adrenalin. Right half.	1. „	R.	Well 1910.
46. Mr. J. G. 57. 21/12/09. 5 weeks.	Tooth.	a. Cocain and adren- alin. Right half. b. Chloro-ether. But- lin.	1. „ 2. Highest gland no malignant cells, sub- maxillary lymphatic gland and that at caro- tid bifurca- tion infil- trated.	R.	Well 1910.
47. Mr. R. H. 62. 25/1/10. 7 weeks.	Tooth.	a. Cocain and adren- alin. Syme. En- tire tongue. b. Butlin.	1. Epithelioma. 2. Higher glands nor- mal, lowest extensively infected.	R.	12/5/10. Local return in tongue and alveolus.

*DISCUSSION.*

Mr. Cathcart said that there were great differences in the degree of malignancy in cancer. Some were very malignant, and even early operation did not save the patient. Other cases of a less malignant type did well after operation even at a late stage.

He was convinced that laryngotomy was an excellent preliminary step for a surgeon of ordinary dexterity. All cases could not be treated by the same method.

Professor Alexis Thomson said that Mr. Caird's account of cases operated on under local anaesthesia, with a subsequent operation for removal of glands, made the procedure appear very simple, but he thought Mr. Caird's results were better than those of other surgeons. The weak point in present operative procedures was the tissue not removed between the tongue and the neck. In sending pieces of growth for diagnosis the surgeon should give the pathologist a fair chance by removing a piece of tissue showing the relationships and not a mere surface scraping.

Mr. Caird, in reply, said that of all cancers those of the tongue were the most malignant. The great benefit of local anaesthesia was that no laryngotomy was required. Recurrence did not frequently occur in the intervening block of tissue Mr. Thomson had referred to. Time might indicate the necessity for doing more than at present, but the question of greater operative risk would then arise.



## A RETROSPECT AND COMPARISON OF THE PROGRESS OF MIDWIFERY AND GYNÆCOLOGY.

THE OPENING ADDRESS OF THE SESSION OF THE EDINBURGH  
OBSTETRICAL SOCIETY.

By F. W. N. HAULTAIN, M.D., F.R.C.P.,  
President.

To occupy the chair of this renowned Society, and to be classified with the many eminent men who have adorned it, is indeed an honour of which I am truly proud. Honours, doubtless, are gratifying, but, as a rule, carry in their train responsibilities corresponding to their magnitude. Alas! the position I am in this evening is no exception.

According to custom, it is my duty to deliver an address, a privilege I feel far from able to cope with in a manner commensurate with the occasion. As necessity compels, however, and it has been my fortunate lot to commence the study of medicine in the late seventies, which may be said to be the date of the birth of modern gynæcology, I have taken the opportunity thus offered of comparing the work of our Society before and after that period, which practically divides its existence into two equal halves.

Before 1878 our Society was mainly concerned (as the name implies) in obstetrics. Gynæcology might be designated in Gilbertian phraseology to be "a thing of plugs and douches." Since that date it has gradually developed, till now it bulks most largely in our deliberations. It has risen from a mere appendage to medical practice to form one of the most prominent specialities of medical science, and has passed from the realms of medicine in its true sense entirely into that of surgery.

In this striking metamorphosis we may proudly assert, without fear of contradiction, Edinburgh has played by far the most prominent part. Without J. Y. Simpson, Lister, Keith, and Tait it is impossible to think of modern gynæcology. The plug, douche, and pessary would still reign supreme. Fibroids and ovarian tumours would still claim their victims with ruthless tyranny, while we as general practitioners would still have added to our sorrows the irksome duty of, with folded hands, trying, with kindly words, to mitigate their present suffering with the problematical hope of a more comfortable old age. Simpson's anaesthesia and Lister's antiseptics made it possible for Thomas

Keith, by his wonderful conscientious assiduity, to make, in the face of much opposition and popular prejudice, ovariectomy one of the most successful operations in modern surgery, and at the same time to lay the foundations of the modern method of performing hysterectomy, which may fairly lay claim to be at the present time the greatest surgical boon to suffering womankind.

No one who was privileged to see his one and only semi-public ovariectomy will forget it. The big theatre of the present Infirmary filled to discomfort: its well festooned with the entire staff, which included many brilliant surgeons; the pale, gaunt surgeon with anxiety stamped on every feature; his weird movements as he manipulated the intestines in hot-soaked towels; the entire stillness, broken only by the hissing of the carbolic spray or the fizzing of the seared pedicle—all seemed to savour more of a wizard's séance than a reality. Alas! the result was unsuccessful, and never again was the opportunity offered of seeing the great surgeon at work.

By the same means Lawson Tait, with his brilliant genius, practically proved the ready accessibility of the peritoneum to surgical interference.

With his intrepid fearlessness he penetrated this sanctuary with scant courtesy in an almost ruthless manner. With his marvellous dexterity, through a two-inch incision, he enucleated inflammatory appendages bound down by dense adhesions, and showed that contamination of the peritoneum by pus was not necessarily fatal. By his brilliant success he did much to develop general abdominal surgery, particularly in regard to inflammatory conditions.

To Keith and Tait modern gynecology may be said to owe its high position. To the former no one would be readier to assign the premier position than the latter. From his own lips I have heard his eulogy, so characteristic of the bigness of the man. To have known and watched both is indeed a privilege. Two more different natures could not well be imagined. Keith careful, anxious, retiring almost to a fault; Tait intrepid, confident, and aggressive. Both, however, striving at the same ideal with equal success. Surely an object-lesson of priceless value!

As has already been said, since the late seventies gynecology has been completely transformed, and has emerged from a medical to a surgical science, and it has been interesting to have watched its development through the phases of antiseptic and asepsis, the former being most aptly illustrated by the carbolic spray, the

latter by rubber gloves. This may at once be said to have been the Alpha and Omega of the metamorphosis.

Up till this time (as the records of our Society show) surgical procedure was very meagre, yet there was evident throughout a latent surgical vitality ready to burst into full vigour whenever opportunity offered. Nothing could be more convincing of this than the attitude of Sir J. Y. Simpson, who in July 1863 said as follows:—

“In the discussion which had recently taken place in the Med. Chirurgical Society some of their brethren seemed aggrieved because he had spoken of the opposition that surgeons here had so long offered to the introduction of the operation. Yet, most assuredly, they had so spoken and written against ovariectomy and its performance that it had been too long kept back out of the list of legitimate operations.

“He had also written and lectured in favour of it. It might be one in three or four of the cases will always die, but one could not doubt that the operation will become more perfect and less fatal as surgeons go on applying themselves with improvement.

“He also strongly advocated removal of the cyst in preference to tapping.”

At the same meeting Dr. Keiller stated he had asked Professors Syme and Spence, then Infirmary surgeons, to remove ovarian tumours, but they absolutely refused.

In 8th June 1840 the note of the first operation specimen brought before the Society was a case of cauliflower excrescence of the os uteri, successfully removed by Dr. Lewins, and at the same meeting Dr. J. Y. Simpson showed a fibrous polypus, the size of a nut, he had cut away.

The next note of an operation was the more ambitious procedure of Caesarean section by Dr. Ross, Invergordon, on 8th March 1842. The child lived, but unfortunately the mother died on the third day “from imprudent exposure.”

In November 1843 Dr. J. Y. Simpson brought forward statistics of twelve cases of laparotomy performed in Britain with four deaths.

In January 1856 a letter from Dr. Clay was read giving the result of sixty-nine collected cases of ovariectomy.

In 1862 a specimen of hydatid of the omentum was shown, successfully removed by Dr. West, Birmingham, which was thought before operation to be an ovarian cyst.

The first example of vaginal surgery was communicated by Dr. Alexander Simpson, in which Dr. J. Y. Simpson opened a supposed pelvic hematoma through the vaginal vault and found a gestation sac, which he successfully removed. He at the same time related a similar case of extra-uterine pregnancy which J. Y. Simpson attempted to remove through the abdominal wall by means of caustic, but the woman sank. In this instance the woman had a history of injury during the early months of gestation, and it was thought the uterus had been fissured.

A note of a successful Caesarean section by Dr. Anderson, Jamaica, was read in December 1863, and notes of two cases of ovariectomy in 1867 and one in 1876 were also intimated.

It is also interesting to see that Dr. Alexander Simpson at this time (1876) had performed three ovariectomies, with one death.

The above is more or less a complete record of the surgical performances brought before the Society.

From this period the *Transactions* of the Society gradually show increasing examples of surgical procedure, till they literally teem in the later volumes. Thus, in 1908-9, forty-one cases of abdominal section alone are recorded.

The development of surgical technique as shown in our *Transactions* is extremely interesting. Thus in ovariectomy, which may be looked upon as the doyen of abdominal surgery, we have a kaleidoscopic picture.

The pedicle was first secured extra-abdominally by clamps, then it was clamped and seared, and dropped into the abdominal cavity; later, to this was added, by Angus Macdonald (one of our most brilliant operators), the ligation of the vessels by silver wire and silk. The cautery was then discarded, and the pedicle secured by silk, catgut, or linen, tied *en bloc* by a variety of knots, such as the Staffordshire and Bantock, and then dropped into the peritoneal cavity. From this we have advanced to ligation in parts and careful inversion of the raw stump, with subsequent covering by peritoneum.

The abdominal wound in the same way was shown to be diversely closed by pins, silver wire, silk, and silkworm gut *en masse*; now the preponderance of opinion is more sentimental, and tends towards catgut in layers, with a final subcutaneous continuous suture.



Perhaps in no instance has change in procedure been so marked as in the after-treatment. At first it was so rigidly severe as to resemble more the tortures of a Chinese prison than the philanthropic endeavours of a charitable profession.

For a fortnight the patient was kept rigidly on her back; the first forty-eight hours after the operation not even a drop of water was allowed to pass over the lips, in spite of the intense thirst always complained of; while the bowels were locked for eight days. How different from the present system! where free movement is permitted from the time the patient is returned to bed, fluids given whenever they can be retained, and the bowels freely opened on the second or third day.

During the eighties and early nineties drainage by the abdomen or vagina was advised in even the simplest cases; now it is practically universally discarded. Many other similar differences might be recorded, but sufficient has been said to show the marked development which has taken place within a comparatively short period.

As is natural to expect, the sacred precincts of the peritoneum having been safely entered, they were rapidly more freely explored. Inflamed and adherent tubes and ovaries were enucleated and removed, and extra-uterine gestation recognised and extirpated. For a time uterine appendages were removed in a manner similar to the appendix in later years, in a wholesale way, without valid reason in many cases. This caused a reaction and swing of the pendulum to the opposite conservative extreme, from which it is doubtful if it has yet returned to the normal mean.

In the early eighties attention began to be turned to the removal of uterine fibromyomata. It is interesting to note in this connection a paper by Dr. A. R. Simpson on the treatment of these tumours, read on 14th November 1877, in which no mention of removal by the abdomen is made. Thomas Keith, however, in his quiet, unostentatious way, now commenced to lay the foundation of a steady attack on these curses to womankind, which was so ably sustained by Angus Macdonald and A. R. Simpson among our fellows.

By stripping the peritoneum from the stump before clamping it extra-abdominally, he had acquired a success unapproached by any other living operator (a less than 10 per cent. mortality). Poor health and the excessive strain told on his nerve, however, before he perfected the operation which he absolutely discarded, and degenerated to the treatment of fibromyomata by Apostoli's electrical methods.

Gradually, as in ovariectomy, the extra-abdominal treatment of the stump gave way to the intra-peritoneal with its varying but progressive refinements, till the operation as practised by us now has as nearly reached perfection as one can possibly conceive. If gynecological surgery had done nothing else than reach the present stage of the treatment of fibroids, anyone might be proud to be identified with it.

In June 1882 Professor A. R. Simpson described the first case before the Society of Vaginal Hysterectomy for Cancer, which, however, proved fatal. In 1884 Angus Macdonald described the first successful case by this route. It was not, however, till well on in the nineties that this suddenly became the fashionable route for abdominal pelvic surgery. For a short time it became a furore, but as an alternative to the abdominal route, except in very special cases, it has ceased to command favour with most surgeons.

Sufficient has been said by even touching thus lightly on the advances of gynecology within the last thirty years to convince anyone of its extraordinary strides, as reflected in the *Transactions* of our Society, and one may now turn shortly to a review of its sister—I might rather say mother—subject, midwifery.

Here one may at the outset say a very different state of matters exists. Little development has taken place. This statement, however, cannot be made in the spirit of reproach. Comparison is impossible. In gynecology we have to deal with a science from its birth, almost conception, through a lusty childhood and vigorous youth. In midwifery, on the other hand, we have a subject in the robust and mature manhood of thousands of years. We may congratulate ourselves, therefore, if we can say that it still even shows signs of development and progress in its advanced years. So far as the Society's *Transactions* show, there was little left for us to teach our predecessors, as embodied in those ten worthies who on 4th December 1839 met together in the New Town Dispensary, Thistle Street, "to consider the propriety of establishing an Obstetrical Society in Edinburgh."

In a general way we might be disposed to flatter ourselves that the management of pregnancy, labour, and the puerperium has advanced since the late seventies. Antiseptics have made a great revolution in our methods. The axis-traction rods to the forceps have added much to the utility and safety of those instruments. The use of hot water has greatly shorn post-partum hæmorrhage of its terrors, and the rapid advance of surgical procedure, by abdominal and other methods, has rendered possible the safe

delivery of cases otherwise apparently hopeless. All of these might be legitimately quoted as improved developments of the last thirty years, and naturally one would expect to find it reflected in the statistical tables of the Registrar-General.

When these are consulted, however, one is staggered at the figures. As the table before you shows (Table I.), the mortality from puerperal causes in Scotland is as high as it was fifty years ago, viz. about 5 per thousand, or 1 in 200 cases.

If one groups the figures before and after 1878 (which is the arbitrary division of this address) we find the general puerperal death-rate in Scotland 4·8 per thousand, and 4·9 since, while from puerperal fever 1·7 per thousand before, and 2·0 since.

Those of Edinburgh are very similar, being from all causes 5·6 per thousand before, and 4·9 since; from puerperal fever 2·1 before, and 1·9 since.

Such figures are most unpleasant reading, and one would like to assume that they may be explained by the unreliability of statistics. Still the figures are there, and explanation difficult. It might be suggested that the registration is now more strict and the grouping of diseases more accurate. This might give a grain of comfort as regards puerperal fever, but not in cases in general, occurring during childbed.

So far as puerperal fever is concerned, the death-rate in England and Wales (see Table II.) is very similar, viz. in 1855 1·6 per thousand, in 1908 1·4, and here it must be remembered the great bulk of cases are attended by midwives. The statistics from other countries show a variable result, but in every instance cited there is a marked diminution, till in Sweden, Holland and Italy it is under 1 per thousand.

Facts such as these would almost seem to prove that the fever death-rate, in spite of antiseptics, still remains the same in the United Kingdom. It is most unwholesome food for reflection, and requires most careful digestion.

The effects of antiseptics have undoubtedly been proved to be of the greatest benefit in hospital treatment of maternity cases, but in private practice, so far as statistics show, there is little evidence of their being of value. This is easy of explanation, as it is well known that hospitals were hotbeds of contagious infection, a condition the cure of which specially lends itself to the principles of antiseptic treatment. Yet (with very occasional exceptions), in spite of the most rigid antiseptic precautions which only hospitals can command, there is a death-rate from fever of 1 per thousand, as gleaned from the aggregate statistics of

five of the most prominent maternity hospitals in the United Kingdom, which show that in 18,820 cases, eighteen septic deaths occurred.

In general practice strict antisepsis and asepsis as in hospitals, is in the majority of cases impossible. That a mortality of 2 per thousand exists in practice generally may not be considered large. In fact, when we think of the nature of the process of childbirth, the extensive raw surfaces, and the area in which they occur, it is, in the face of our knowledge of the modes of infection, almost incredible that it is so low.

There can be no doubt that Nature has conferred a special immunity on these parts, by the germicidal properties of the vaginal secretions, and other means we are yet ignorant of, as proved by the extreme rarity of virulent germs in the genital canal, though there are myriads at its orifice. If it were not so, no placental site could escape, not to say perineal and other tears. If the secretions, &c., are normal, it would appear as if severe infection were impossible. On the other hand, should they have lost their germicidal qualities, as shown by the detection of virulent organisms in the vagina before labour, infection is prone to occur, whether introduced by the attendant or not.

That all infection is preventable is, without doubt, a most desirable working idea to aspire to, but, I am afraid, is Utopian in reality.

No one is more rigidly in favour of the antiseptic management of labour than I. Without it our consciences would make us miserable. To say that the antiseptic management of labour is of no value, in the light of our knowledge of infection, would be absurd, and exceedingly wrong so far as teaching is concerned. Yet there can be no gainsaying the fact that its apparent results fall far below legitimate expectations.

There can be no reasonable doubt that labours in general, in the light of our knowledge of infection and resulting teaching, are more carefully and cleanly treated than formerly when the elements of infection were unknown; and hence it is impossible that direct heterogeneous infection can be so common. Further, the cure of many infected cases by antiseptics must be accepted. In the face of this we can only account for the maintenance of the death-rate at the same percentage by an increase of germs in our surroundings, the result of centralisation in cities and overcrowding.

This is only in keeping with the marked increase of appendicitis, septic pneumonia, and other like affections.



By antiseptics, it seems we have been able to keep the death-rate where it was; without them the results would be tragic to contemplate.

This is aptly illustrated by the statistics of the mortality from puerperal septicæmia in England and Wales:—

“Up till 1900 there was an increasing number of deaths from sepsis, since then it has decidedly dropped. To the adoption of the Midwives Act this may fairly be said to be due, the majority of mothers being now attended by women educated in the principles of cleanliness and anti-sepsis.

“In 1902, when this Act came into force, the death-rate from puerperal sepsis per million women was 118.

“In 1907 it fell to 81. As the 1901 census shows the number of women in England and Wales to be 16,800,000, the fall of 37 per million means that, without estimating actual increase in the number of women, 621 women were saved from this disease alone who would have died in 1902.” (Champneys.)

Though 2 per thousand seems but a small percentage of mortality, it shows a terrible toll when the aggregate of birth in this country is considered. To say that it is apparently an irreducible minimum would be unworthy of our profession, and a plea to relax efforts in combating its ravages.

The antiseptic management of labour must form the keystone of obstetric practice and teaching, and there is still much scope for it to be more rigidly enforced.

Though, in spite of antiseptics, the mortality from puerperal fever remains the same as fifty years ago is difficult to believe, when we come to face the statistical figures of deaths from other puerperal diseases, and find a similar state of affairs, it becomes almost incredible. Is it that our up-to-date methods are mere fashionable millinery? or is it that woman in modern civilisation is becoming more fragile and degenerate? or that labours are more difficult from the increased size of the child's head—the result of intellectual development? Whatever it may be, statistical figures again show a similar condition of affairs. In Scotland, in 1855, the death-rate from other puerperal causes was 3·6 per thousand; in 1908, 3·3; while in Edinburgh it is shown to have increased.

On consulting Table III. this will be found to be due mainly to the great number of deaths from puerperal convulsions, which show an increase of nearly double.

Statistics are unreliable, and should not in any way be allowed to overcome methods which are based on a true scientific foundation, and, when adverse, should merely act as a greater stimulus to further development.

In England there is a marked drop from general puerperal diseases other than sepsis—from 2·9 per thousand to 2. This can be readily accounted for by the difference in their form of registration, which does not include under puerperal deaths pregnancy associated with Bright's disease, pneumonia and heart affections, &c., which are all included in Scottish puerperal statistics. By their inclusion the mortality percentage would be raised to about the same as that of Scotland and Ireland.

The enormous increase of deaths from eclampsia in Scotland merits the closest attention. It has become a real scourge, and, so far, is apparently unpreventable.

According to statistics of hospitals—

In Dublin Rotunda Hospital in 4 years—from 1906 to 1909 inclusive—there were 36 eclamptic cases, with 4 deaths, in 7845 cases of labour.

In Queen Charlotte's in 4 years—1906 to 1909 inclusive—there were 37 eclamptics, with 6 deaths, in 7000 cases.

In Edinburgh Maternity Hospital in 4 years—1906 to 1909 inclusive—there were 68 eclamptics, with 24 deaths, out of 2027 cases.

In comparing these we find the astonishing results that in Dublin and Queen Charlotte's the percentage of eclampsia is 5 per cent., in which 14 per cent. were fatal, while in Edinburgh the percentage is 3 per cent., or 6 times greater, and of these 35 per cent. died, or  $2\frac{1}{2}$  times more fatal.

In St. Mary's Hospital, Manchester, there were only 11 eclamptics in 4558 cases, or 24 per cent. Of these, however 6 died, or 63·6 per cent. This shows a still smaller percentage of cases, with a much increased mortality.

From these figures it is evident we in Scotland are specially prone to the development of this dread complication, not only in frequency but in potency.

Our methods of treatment are as up to date and in every way similar to those of other institutions, yet our death-rate is enormously higher. So far as the disease is concerned, we undoubtedly know more within recent years as regards its development from a physiological standpoint, yet from the aspect of prevention and treatment we are still hopelessly ignorant.

It is feasible to imagine that the marked increase in Scotland

is due, perhaps, to the great difference in diet of the populace, who fifty years ago subsisted to a great extent on farinaceous food, instead of the highly nitrogenous feeding they now adopt. To this must be added the difference in climate, which, as has been frequently asserted, has apparently some effect on the development of eclampsia.

Knowing as we do, however, the extremely beneficent effects of dieting in albuminuria cases during pregnancy, a special effort should be made to try and instil into the minds of the masses the important necessity of having their urine tested in the later months of pregnancy as a routine. By this means alone, in the light of our present knowledge, can we hope to reduce the terrible mortality which exists from this complication of labour.

In considering, however, the sustained mortality from puerperal causes other than septicæmia, one cannot lay it entirely at the door of eclampsia, as we find on consulting Table III. that the mortality from placenta prævia, hæmorrhages, and other causes remains almost stationary. It is hard, indeed quite impossible, to believe that no real advance has been made in the successful management of complicated labour in the last fifty years, but, so far as the figures show, little tangible benefit has resulted.

If advance has been made, it must be compensated by a large increase in the number of complicated cases, which goes to show that so-called civilisation is tending towards extinction of the race, which is only maintained by improved methods of obstetric practice.

Look at it as we may, there is no obscuring the hard fact that one in two hundred women die in the so-called natural process of propagation of the race, in spite of our best-directed efforts on their behalf. The odds in favour of a woman having a family of five without losing her life are only forty to one. It would almost seem as if reproduction had passed from the physiological to the pathological.

Having dwelt thus shortly on the past progress of obstetrics and gynæcology, it is difficult to leave the subject without turning one's thoughts to the future and indulging in innocent speculation.

In this age of increasing specialism it is needless to say that gynæcology has naturally become one of the most prominent specialities.

Though developed by the obstetrician, its essentially surgical character has naturally attracted the attention of the general surgeon, who, in many instances, has considered it a legitimate

part of his calling, and accordingly annexed it. A state of guerilla warfare has therefore resulted over the ridge of the ilio-pectineal line, he (the surgeon) making incursions on the pelvis from the abdomen, on the pretext that an obstetrician is no trained surgeon, while, on the other hand, the gynæcologist, considering the surgeon was dealing with organs he knew nothing about, in the spirit of retaliation, pushed his campaign into the abdomen from the pelvis. Such a condition of affairs, though natural to expect in a new speciality, cannot continue to exist. For a time it may do so, but it seems to me a new speciality will eventually arise represented by the "abdominal surgeon."

It is, on the one hand, essential that the gynæcologist must be a thoroughly trained surgeon, while, on the other, the surgeon must be a thoroughly trained obstetrician.

It is absolutely necessary for the efficient and safe removal of uterine and fibroid tumours that the operator must be able to meet with any emergency, such as resection of the gut or the treatment of other abdominal conditions, for which the tumours may have been mistaken or otherwise complicated. Thus there seems no reason why the operator should not primarily operate for these conditions both in male and female.

In the same manner the operator must be thoroughly versed in the diagnosis of pelvic and other conditions, be able to eliminate pregnancy, and also be thoroughly conversant with the effects on pregnancy and labour of the operations he performs. He must not be a mere mechanic doing piecework on lines drafted by another, but have a thorough grasp of each individual case from both its physiological and pathological aspects.

The average general surgeon takes a pride in his ignorance of obstetrics; to the efficient abdominal surgeon of the future its knowledge must form a *sine qua non*.

It may be said that the so-called pure abdominal surgeon is a needless refinement of specialism already carried to excess! In this I do not agree. Specialism is only in its infancy, and is advancing in popular favour rapidly. It is the tendency of the age, not only in our, but in every other profession,—the result of increasing knowledge—which makes it impossible for one individual to have a thorough grasp of every branch.

In my opinion the time is not far distant when, in large cities, there will be a complete change in medical practice. Specialists will be rampant in their various spheres merely as specialists, not as consultants. They will ply their calling for ordinary visiting fees, and will be employed directly without consultation, and will form



a class of special practitioners. They will thus become much more accessible to the public, to the majority of whom consultants' fees are at present prohibitive, a state of affairs which probably accounts for the gross abuse of the special departments of our charitable institutions. That the general practitioner will become extinct I would not for a moment suggest, nor would I like to think. The family doctor never will be dispensed with; nothing could be more undesirable. Yet, from the increasing army of specialists working for similar fees, his numbers will be reduced, his assumed prescriptive right to attend the family under all circumstances removed, and thus medical etiquette rendered less involved.

Such a transformation may seem merely fanciful, but the drift of medical practice is strongly in this direction. Many of my older practitioner friends have told me of the rapid change that is occurring in their own experience, due to the inroads of specialism, especially among the well-to-do classes. That it is desirable is doubtful. The public, however, pay the money and call the tune. It is a subject full of importance and open to controversy; but I have already seriously digressed and leave it for contemplation.

One other subject in this comparative review of obstetrics and gynaecology which merits consideration is the teaching.

In gynaecology, as is to be expected from its rapid development, many changes have occurred, particularly from its practical aspect; till now it forms a special practical part of the final examination.

Obstetrics, on the other hand, remains *in statu quo*, with the single exception that theoretically it has been divorced from gynaecology so far as the teachers are concerned. That this is desirable is very doubtful. As has already been pointed out, the abdominal surgeon or gynaecologist must be an expert obstetrician. The organs concerned, their method of examination, the origin of the pathological from the physiological, all go to blend midwifery and gynaecology so intimately together that it is impossible that a thorough knowledge of the one can exist without an intimate acquaintance with the other.

To the gynaecologist the question of pregnancy ever asserts itself in his differential diagnosis—its presence, future possibility, or the exciting cause of existing conditions.

In other words, to alienate gynaecology from midwifery is to destroy its very existence and submerge it in the vast domain of surgery, which is a retrograde step.

It seems questionable, therefore, that students should be taught by different lecturers, however brilliant they may be, for on

individual subjects their ideas may be different, and thus the continuity which is the essential of effective teaching, is lost. Further, it tends to dissociate the intimate relationship of the two subjects in the pupil's mind.

The expert gynecologist must be primarily an expert obstetrician, else the branch is broken from its parent stem. In actual practice it may be unworkable that the practice of abdominal surgeon or gynecologist be combined with obstetrics; this is, however, merely a matter of practical convenience, and there is no valid reason why they should not be practised together except from this standpoint.

It seems to me that no one would be better fitted to manage complicated labours than the so-called abdominal surgeon, trained in the manner I have previously suggested. The methods of delivery in difficult labours are on the same platform as other manipulative surgical procedures, while the growing frequency of Caesarean section, symphysiotomy, &c., render it essential that the expert obstetrician must be surgically trained.

Of much more importance, however, is the training of practical midwifery, which, unlike its sister branches of medicine and surgery, remains in essentially the same position it was thirty years ago. No advance has been made. The student is merely required to be present at a certain number of so-called clinics, and attend personally a given number of cases, or, as an alternative, attend personally twenty-five cases of labour.

True, the General Medical Council have proposed as an alternative, residence for a month in a lying-in institution, which is a step in the right direction, but, alas! this is not compulsory.

To all of us it may be assumed as an accepted fact that the only method of clinical instruction is seeing cases actually managed, be they medical, surgical, or obstetric. In the two former the greatest attention in this school has been given, that this should be acquired by the student. In midwifery, alas! it is not so.

The student is allowed by attending twenty-five probably normal cases to gain a certificate in practical midwifery. More than likely he may, in these cases, never see an abnormality. Even if he has added to this, attendance at so-called clinics at given hours, his clinical knowledge of abnormalities is as prone to be equally deficient. To go round the puerperal wards of a hospital is entirely begging the question of true clinical instruction. Abnormal cases must be actually seen in progress and their management noted. It must be remembered that the essence of

obstetric practice is to be able to conduct abnormal cases. If all confinements were normal, obstetrics as an art would cease to exist, and be practised by nurses and neighbours.

We as doctors are only paid to attend in case of accidents suddenly arising which demand prompt attention. How are students to be efficient in their management unless they have seen similar cases treated? Is it fair to turn them loose on the public with merely a book knowledge when clinical instruction can be had? The parade of the puerperal wards, so far as true clinical instruction in the management of labour is concerned, is a farce, and might be as thoroughly conducted at Madame Tussaud's. They are merely of value clinically as a training in the management of the puerperium.

In the medical wards of the Infirmary, students are not shown patients who *had* pneumonia, but who are actually suffering. In like ways in the surgical wards they are not shown patients with stumps only, but see the actual amputation and follow their course after. Why should it be different in midwifery? Is it not more essential that he should be shown forceps applied or hæmorrhage arrested, which he may have to do without assistance the day after he qualifies?

Is attendance on twenty-five cases of normal labour, where he simply stands by, Micawber-like, of any value to the student in teaching him how to act in an emergency? Yet when he goes into practice he is engaged and paid by the public as experienced, in case of complication.

It is needless to say that the only method by which he can gain a clinical knowledge of the management of abnormal labour cases is by residence in a lying-in hospital, where not only is the labour seen, but the case followed during convalescence.

It has been argued that this is impossible: firstly, because there are not sufficient facilities, and secondly, that it will interfere with his lectures and other work.

In Edinburgh, fortunately, the first argument falls to the ground: the hospital facilities are ample for the clinical training of all. As regards the second, it seems to me that personal attendance on twenty-five cases will probably interfere more with his work both day and night than residence in a hospital for a month.

If our aim is to turn out efficiently trained obstetricians, there is but one way, and that is by hospital residence. It is bound to come in time if we as obstetricians are to keep pace with the improvements of clinical methods in medicine and surgery. It

is already compulsory in one Scottish school—Aberdeen; and Glasgow and St. Andrews have declared in favour of it. Let us hope that Edinburgh, which has been so closely identified with the progress of obstetrics under the guidance of Simpson, Matthews Duncan, and others, shall be in the van by making it compulsory, and not be coerced into it after other schools have adopted it.

At the risk of further wearying you before concluding, one other subject might be touched upon, viz. the teaching and training of nurses and midwives.

At the present time the majority of women trained in Scottish Maternity Institutions take the qualifying certificate of the General Midwives Board as an advanced diploma, principally as a hall-mark of efficiency. For this they have to be examined in England, which has acquired the prescriptive right of granting it, on the plea that the Midwives Act applies to England only.

Further, the requirements of this Board are so exacting that it is impossible for nurses and students to be trained on the same cases, which very seriously handicaps the training of both, in this and other Scottish schools, from the want of sufficient clinical material.

To obviate this unnecessary trouble on the part of women who desire a certificate of a general standard of efficiency, and allow of more use of our material being made, it would seem desirable that a Scottish diploma should be granted on similar lines.

There is, I believe, an active movement on foot at present in favour of extending the Midwives Act to Scotland. Should this be so, our endeavours must be directed to a special Act where the irksome and unnecessary demands of the English Act are so modified as to make it possible for our training of both students and midwives in our own hospitals.

This I consider of extreme importance, and must be at once energetically faced, otherwise we shall be left in a most unenviable position.

In having dwelt upon such a number of important and highly controversial subjects, I feel I have exercised my prerogative in addressing you to the full, and must claim your indulgence.

Should I have elicited any moot points of interest unknown to you, and stimulated thought towards their elucidation, I am proud. In all humility I have approached them, and I again thank you for having given me the opportunity of doing so by addressing you this evening.



TABLE I.—*Puerperal Deaths, 1855-1909.*

Year	Esti- mated Number of Confinement- ments.	SCOTLAND.				Esti- mated Number of Confinement- ments.	EDINBURGH.			
		Deaths from		Deaths per 1000 Confinements from			Deaths from		Deaths per 1000 Confinements from	
		Puerperal Fever.	Other Puer- peral Causes.	Puer- peral Fever.	Other Puer- peral Causes.		Puerperal Fever.	Other Puer- peral Causes.	Puer- peral Fever.	Other Puer- peral Causes.
1855	96,850	169	341	1.7	3.6	4788	10	16	2.1	3.3
1856	105,556	143	351	1.4	3.3	5487	6	25	1.1	4.5
1857	107,186	145	304	1.4	2.8	5516	9	21	1.6	3.8
1858	107,858	152	302	1.4	2.8	5378	12	13	2.2	2.4
1859	110,445	175	333	1.6	3.0	5687	19	20	3.3	3.6
1860	109,553	236	328	2.2	2.9	5616	18	16	3.2	2.9
1861	111,010	203	308	1.8	2.8	5940	16	24	2.7	4.0
1862	111,042	130	305	1.2	2.7	5975	16	19	2.7	3.2
1863	113,465	195	376	1.7	3.3	6412	11	23	1.7	3.6
1864	116,526	254	374	2.2	3.2	6388	19	18	3.0	2.8
1865	117,272	213	422	1.8	3.6	6427	14	25	2.2	3.9
1866	117,891	181	356	1.5	3.1	6480	14	18	2.2	2.7
1867	118,285	163	321	1.4	2.7	6704	17	18	2.5	2.7
1868	119,743	140	354	1.2	2.9	6889	12	36	1.7	5.3
1869	117,513	153	410	1.3	3.5	7007	10	26	1.4	3.7
1870	119,687	202	381	1.7	3.2	6980	16	21	2.3	3.0
1871	120,535	225	420	1.9	3.5	7132	12	32	1.7	4.5
1872	123,228	219	391	1.8	3.2	6899	17	26	2.5	3.7
1873	124,173	251	325	2.0	2.6	7037	15	25	2.1	3.6
1874	128,282	378	442	2.9	3.5	7094	11	27	1.6	3.8
1875	128,187	389	459	3.0	3.6	7002	17	27	2.4	3.9
1876	131,283	231	374	1.8	2.8	7311	5	20	0.7	2.7
1877	131,637	163	394	1.2	3.0	7529	3	22	0.4	2.9
1878	131,651	164	380	1.2	2.9	7705	17	21	2.2	2.7
1879	130,450	184	397	1.4	3.1	7693	14	23	1.8	3.0
1880	129,272	185	416	1.4	3.2	7823	10	22	1.3	2.8
1881	130,963	235	462	1.8	3.5	7613	22	19	2.9	2.5
1882	130,965	267	403	2.0	3.1	7568	26	14	3.4	1.9
1883	129,205	363	427	2.8	3.3	7106	22	20	3.1	2.8
1884	134,045	336	371	2.5	2.8	7749	19	20	2.5	2.5
1885	130,881	374	405	2.9	3.1	7646	16	21	2.1	2.7
1886	132,866	270	331	2.0	2.5	7713	12	14	1.6	1.8
1887	129,199	275	338	2.1	2.6	7852	19	30	2.4	3.8
1888	127,958	309	351	2.4	2.8	7770	17	20	2.2	2.6
1889	127,407	277	346	2.2	2.7	7697	13	18	1.7	2.3
1890	126,083	324	363	2.6	2.8	7446	18	33	2.4	4.4
1891	130,815	378	340	2.9	2.6	7630	17	20	2.2	2.6
1892	129,718	315	373	2.4	2.9	7450	13	20	1.7	2.7
1893	131,902	252	336	1.9	2.6	7708	12	24	1.6	3.1
1894	129,036	285	342	2.2	2.7	7494	13	12	1.7	1.6
1895	131,384	253	355	1.9	2.7	7683	8	24	1.0	3.2
1896	134,019	220	357	1.6	2.7	7899	17	18	2.2	2.2
1897	133,846	205	331	1.5	2.5	8292	9	20	1.1	2.4
1898	135,852	227	351	1.7	2.6	8405	9	19	1.1	2.2
1899	135,702	214	341	1.6	2.5	8525	9	29	1.1	3.4
1900	136,318	225	342	1.7	2.5	8435	12	19	1.4	2.3
1901	137,150	S. 118 P. 4 E.* 158	347	2.0	2.6	8213	S. 8 P. 0 F.* 7	24	1.8	2.9
1902	137,127	106 3 198	375	2.2	2.8	8407	14 0 8	25	2.6	3.0
1903	138,489	110 6 175	418	2.1	3.0	8394	1 0 9	38	1.2	4.5
1904	137,512	113 2 126	374	1.8	2.7	8063	9 0 4	23	1.6	2.9
1905	136,245	124 5 119	450	1.8	3.5	8030	8 0 4	33	1.5	4.1
1906	136,961	123 10 130	442	1.9	3.3	7936	7 0 4	22	1.4	2.8
1907	133,492	135 6 87	451	1.7	3.4	7786	9 1 4	32	1.8	4.1
1908	136,140	107 3 121	435	1.7	3.3	7784	5 0 5	35	1.3	4.5
1909	...	...	...	...	...	7688	9 0 3	35	1.6	4.5

\* S = Septicæmia and Sapræmia.

P = Pyæmia.

F = Fever.

TABLE II.

## ENGLAND AND WALES.

Year.	Births Registered.	Estimated Confinements.	Deaths from		Deaths per 1000 Confinements from	
			Puerperal Fever.	Other Puerperal Diseases.	Puerperal Fever.	Other Puerperal Diseases.
1855	635,043	658,860	1079	1900	1.6	2.9
1860	684,048	709,703	987	2186	1.4	3.1
1865	748,069	776,125	1333	2490	1.7	3.2
1870	792,787	822,520	1492	2383	1.8	2.9
1875	850,607	882,509	2504	2560	2.8	2.9
1880	881,643	914,708	1659	1833	1.8	2.0
1885	894,270	927,809	2420	2029	2.6	2.2
1890	869,937	902,563	2016	2239	2.2	2.5
1895	922,291	956,881	1927	2292	2.0	2.4
1900	927,062	961,831	2017	2438	2.1	2.5
1905	929,293	964,146	1734	2171	1.8	2.3
1908	940,383	975,652	1395	1966	1.4	2.0

## IRELAND.

1865	144,970	150,407	284	644	1.9	4.3
1870	149,846	155,466	360	670	2.3	4.3
1875	138,320	143,508	442	563	3.1	3.9
1880	128,086	132,890	347	544	2.6	4.1
1885	115,951	120,300	370	495	3.1	4.1
1890	105,254	109,201	252	440	2.3	4.0
1895	106,113	110,093	321	448	2.9	4.1
1900	101,459	105,264	236	414	2.2	3.9
1905	102,832	106,689	227	346	2.1	3.2
1908	102,039	105,866	189	341	1.8	3.2

## FINLAND.

1870	63,748	66,139	...	535	...	8.1
1875	69,521	72,128	...	629	...	8.7
1880	74,784	77,589	...	654	...	8.4
1885	75,129	77,947	...	536	...	6.9
1890	77,860	80,780	...	460	...	5.7
1895	81,783	84,850	...	454	...	5.4
1900	86,339	89,577	...	427	...	4.8
1905	87,841	91,135	...	374	...	4.1

## NORWAY.

1870	50,434	52,325	144	...	2.8	...
1875	56,358	58,472	183	...	3.1	...
1880	58,923	61,133	147	...	2.4	...
1885	61,052	63,342	165	...	2.6	...
1890	60,108	62,362	159	...	2.5	...
1895	62,932	65,292	94	...	1.4	...
1900	66,149	68,630	111	73	1.6	1.1
1905	...	...	...	...	...	...

TABLE II.—*Continued.*

SWEDEN.						
Year.	Births Registered.	Estimated Confinements.	Deaths from		Deaths per 1000 Confinements from	
			Puerperal Fever.	Other Puerperal Diseases.	Puerperal Fever.	Other Puerperal Diseases.
1865	134,281	139,317	299	...	2.1	...
1870	119,838	124,332	330	...	3.1	...
1875	135,958	141,057	457	...	3.2	...
1880	134,262	139,297	338	...	2.4	...
1885	137,308	142,458	314	...	2.2	...
1890	133,597	138,607	173	...	1.2	...
1895	134,599	139,647	187	...	1.3	...
1900	138,139	143,320	121	...	0.8	...
1905	...	...	...	...	...	...
SWITZERLAND.						
1880	84,165	87,322	361	382	4.1	4.4
1885	80,349	83,362	436	309	5.2	3.7
1890	78,548	81,494	253	261	3.1	3.2
1895	84,973	88,160	217	281	2.5	3.2
1900	94,316	97,853	193	330	2.0	3.4
1905	94,653	98,203	253	...	2.6	...
HOLLAND.						
1875	138,469	143,662	235	651	1.6	4.5
1880	143,855	149,250	166	360	1.1	2.4
1885	148,028	153,580	214	463	1.4	3.0
1890	149,329	154,929	189	351	1.2	2.8
1895	158,130	164,061	154	328	0.9	2.6
1900	162,611	168,710	144	314	0.9	1.9
1905	170,767	177,172	119	295	0.7	1.7
ITALY.						
1887	1,152,906	1,196,145	2504	4436	2.1	3.7
1890	1,083,103	1,123,724	1682	2713	1.5	2.4
1895	1,092,102	1,133,061	1514	1893	1.3	1.7
1900	1,067,376	1,107,407	1033	2001	0.9	1.8
1905	1,084,518	1,125,192	977	2221	0.9	2.0

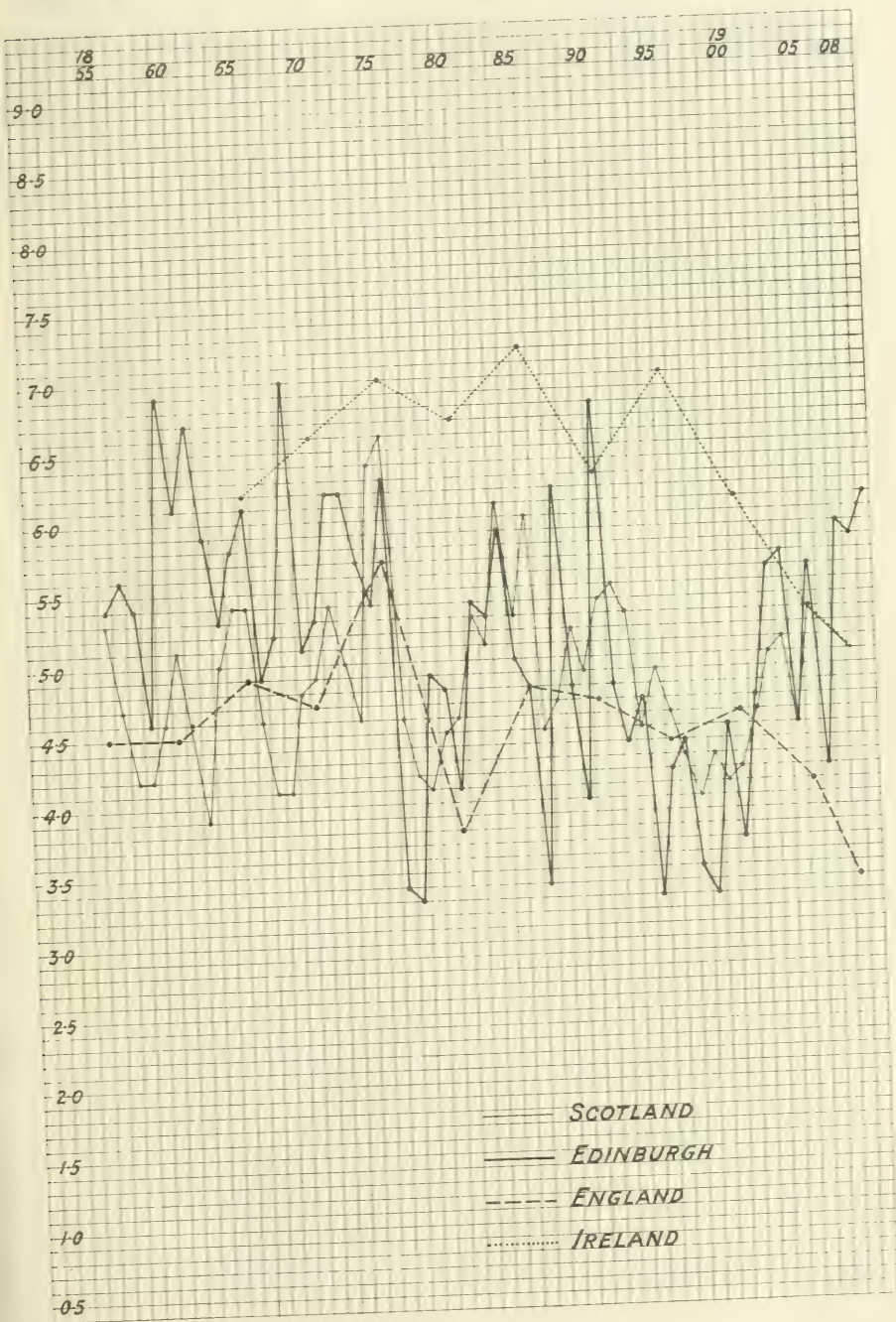
TABLE III.—*Scotland.*

Year.	Deaths from					
	Abortion, Miscarriage.	Puerperal Mania.	Puerperal Convulsions.	Placenta Praevia, Flooding.	Phlegmasia, Dolens.	Other Accidents of Childbirth.
1883	45 <b>·34</b>	27 <b>·21</b>	40 <b>·31</b>	83 <b>·64</b>	8 <b>·06</b>	224 <b>1·73</b>
1884	26 <b>·19</b>	17 <b>·13</b>	16 <b>·34</b>	84 <b>·63</b>	12 <b>·09</b>	186 <b>1·39</b>
1885	26 <b>·20</b>	26 <b>·20</b>	36 <b>·28</b>	94 <b>·72</b>	11 <b>·08</b>	212 <b>1·62</b>
1886	30 <b>·23</b>	14 <b>·11</b>	37 <b>·28</b>	79 <b>·59</b>	6 <b>·05</b>	165 <b>1·24</b>
1887	32 <b>·25</b>	15 <b>·12</b>	47 <b>·36</b>	76 <b>·59</b>	9 <b>·07</b>	159 <b>1·23</b>
1888	45 <b>·35</b>	18 <b>·14</b>	50 <b>·39</b>	79 <b>·62</b>	11 <b>·09</b>	148 <b>1·16</b>
1889	49 <b>·33</b>	15 <b>·12</b>	53 <b>·42</b>	78 <b>·61</b>	7 <b>·05</b>	144 <b>1·13</b>
1890	41 <b>·35</b>	13 <b>·10</b>	45 <b>·36</b>	75 <b>·59</b>	3 <b>·02</b>	183 <b>1·45</b>
1891	36 <b>·28</b>	14 <b>·11</b>	59 <b>·45</b>	80 <b>·61</b>	12 <b>·09</b>	139 <b>1·06</b>
1892	46 <b>·35</b>	22 <b>·17</b>	72 <b>·56</b>	85 <b>·66</b>	13 <b>·10</b>	135 <b>1·04</b>
1893	35 <b>·27</b>	14 <b>·11</b>	60 <b>·45</b>	64 <b>·49</b>	6 <b>·05</b>	157 <b>1·19</b>
1894	23 <b>·22</b>	17 <b>·13</b>	54 <b>·42</b>	86 <b>·67</b>	17 <b>·13</b>	140 <b>1·08</b>
1895	19 <b>·14</b>	20 <b>·15</b>	46 <b>·35</b>	84 <b>·64</b>	13 <b>·10</b>	173 <b>1·32</b>
1896	28 <b>·21</b>	7 <b>·05</b>	67 <b>·50</b>	67 <b>·50</b>	7 <b>·05</b>	181 <b>1·35</b>
1897	33 <b>·25</b>	10 <b>·07</b>	54 <b>·40</b>	82 <b>·61</b>	7 <b>·05</b>	145 <b>1·08</b>
1898	26 <b>·19</b>	6 <b>·04</b>	73 <b>·54</b>	88 <b>·65</b>	9 <b>·07</b>	149 <b>1·10</b>
1899	14 <b>·10</b>	6 <b>·04</b>	75 <b>·55</b>	106 <b>·82</b>	2 <b>·01</b>	138 <b>1·02</b>
1900	34 <b>·25</b>	9 <b>·07</b>	69 <b>·51</b>	79 <b>·58</b>	6 <b>·04</b>	145 <b>1·06</b>
1901	24 <b>·17</b>	10 <b>·07</b>	58 <b>·42</b>	81 <b>·59</b>	7 <b>·05</b>	167 <b>1·22</b>
1902	30 <b>·22</b>	11 <b>·08</b>	58 <b>·42</b>	60 <b>·44</b>	12 <b>·09</b>	204 <b>1·49</b>
1903	25 <b>·18</b>	9 <b>·06</b>	100 <b>·72</b>	94 <b>·68</b>	12 <b>·09</b>	178 <b>1·29</b>
1904	27 <b>·20</b>	10 <b>·07</b>	76 <b>·55</b>	86 <b>·63</b>	4 <b>·03</b>	171 <b>1·24</b>
1905	35 <b>·26</b>	9 <b>·07</b>	95 <b>·70</b>	101 <b>·74</b>	20 <b>·15</b>	210 <b>1·54</b>
1906	31 <b>·23</b>	7 <b>·05</b>	88 <b>·64</b>	86 <b>·63</b>	12 <b>·09</b>	230 <b>1·68</b>
1907	25 <b>·19</b>	6 <b>·04</b>	89 <b>·67</b>	91 <b>·68</b>	7 <b>·05</b>	240 <b>1·80</b>
1908	29 <b>·21</b>	10 <b>·07</b>	81 <b>·59</b>	81 <b>·59</b>	10 <b>·07</b>	234 <b>1·72</b>

Figures in heavy type show rate per 1000 confinements.



DEATH RATE PER 1000 CONFINEMENTS FROM PUERPERAL CONDITIONS.



## ON RECURRENT ENLARGEMENT OF THE SALIVARY GLANDS.

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THE comparative paucity of literature on the subject of recurring enlargement of the salivary glands, is an indication either that the occurrence is somewhat uncommon, or that the condition is one of little importance. A considerable experience of glandular enlargements is likely to be required, before even a few of such cases can be collected in any individual practice, and on this very account the chances of missing the diagnosis are increased. Certain it is that the condition may exist in so slight a degree that no advice is sought, and it may be only when frequent recurrence increases the patient's discomfort or merely stimulates his curiosity, or because an acute exacerbation has supervened, that he submits the condition to professional investigation. Again, so far as the affection of the parotid glands is concerned, the diagnosis of mumps may be made, and unwarrantable isolation enforced, under the belief that the patient is suffering from a contagious disease.

In an experience of some fifteen hundred cases of glandular enlargement I have notes of but five cases of recurrent enlargement of the salivary glands, and of these three were submaxillary and two parotid. It is doubtful if the parotid affection be more common than the submaxillary, though it is more apparent, and therefore more likely to enforce consideration; and I have not been able to find any report in which the condition was recognised in the sublingual glands. My cases are as follows:—

CASE I.—A butcher, aged 24, a healthy, well-developed man, came under my observation in 1899 complaining of a recurring swelling under the right jaw, of fully seven weeks' duration. He noticed that, when eating, his neck under the right jaw became swollen. Since its onset the swelling had been constantly present, but only became obvious at meal times, beginning when he commenced to eat, and being largest when he had finished. It had become more distinct during the last two weeks. Between meals there was a slight hardness but no tenderness at the site of swelling. On examination the right submaxillary gland was found to be somewhat swollen and firm. No calculus could be

felt, and firm pressure on the gland was slightly painful. He was under my observation for twenty days, during which time the condition remained unchanged. He then had belladonna ointment applied by innunction over the tumour, and, whether by coincidence or otherwise, in a day or two the trouble had ceased. I did not see him again for ten years, until the 10th of July 1909, when the condition was once more present. He informed me that he had had an annual recurrence, generally in the springtime, but it gave him no special concern. The obvious swelling could now be easily palpated bimanually with one finger in the mouth. It was firm and slightly painful on pressure, and eating so distinctly increased his discomfort that at times he preferred not to eat. Within a few days it again disappeared.

CASE II.—A weaver, aged 23, complained of recurrent swelling under the right jaw, of one year's duration. This patient had a small sebaceous cyst in the skin at the angle of the jaw, and immediately in front of this a recurrent swelling would appear during eating, or if she talked a great deal. It formed a rounded tumour about the size of a marble, evidently submaxillary, and contained no calculus. On each occasion all discomfort vanished within two or three minutes after she had finished eating.

CASE III.—A married woman, aged 44, presented a recurrent swelling of the right submaxillary gland which had existed off and on for two months. She thought she had caught cold shortly before its appearance, for she had had a sore throat and a cold in the head, and it was then that the right submaxillary gland first swelled. On palpation in the mouth the enlarged gland could be distinctly felt, with an abnormal hardness in consistency.

These cases all relate to submaxillary affections. The following are two in which the parotid participated:—

CASE IV.—An unmarried lady, aged 35, consulted me in September 1907 for a swelling of the right parotid which had recurred during eighteen months. Her first attack occurred in February 1906. It was ushered in somewhat suddenly at night, with pain about the upper part of the gland, and by the following morning the entire gland was enlarged. The doctor whom she consulted pronounced it "mumps," and she was isolated for twenty-four days. There were no other cases of mumps in the neighbourhood, nor did the children in the house develop mumps. Fomentations were applied and the parotid region painted with iodine. The swelling remained through fully a fortnight, and she could not open her mouth during the first day or two. There was some pyrexia during the first ten days. The temperature never

rose to over  $100^{\circ}$ , but did not come to normal while the swelling lasted. Her second attack came on in April 1907. It came on suddenly during the night, and when she wakened with the pain she found the parotid swollen about the upper part or socia. She was a week indoors. The temperature again continued raised, but only slightly, and the doctor kept her in bed on that account. Pain only existed during the first day. Her third attack came on with some tenderness in September 1908 during the night, and the discomfort continuing, she found next morning that the gland was swollen and she could not open her mouth easily nor fully rotate her head. The swelling was hard, situated under the jaw, and behind the ascending ramus. She remained in bed, and in the afternoon took her temperature and found it to be  $99.8^{\circ}$ . The pain was as usual worse during and after eating. The swelling was distinctly less on the second day, and the lower part of the gland formed a vaguely defined enlargement over and behind the body of the right lower jaw, and was slightly tender to touch. On this, as on the first occasion, a cold in the head preceded the attack. She is very liable to "little blisters" in the mouth, though all her teeth are artificial. I only had the opportunity of observing one other attack before the patient left the district, though she had had a fourth attack in January in which the same gland was involved, the affection lasting six days. In February 1908 she wakened with a headache and had pain about the socia parotidis on the left side. She felt miserable all evening, and went to bed shivery and out of sorts. Next day there was evidence of a little hardness at the lower part of the gland at the commencement of the duct. This disappeared in a day or two. Two years elapsed before she had another attack. On the morning of 20th January 1910 she awoke feeling the cheek swollen and stiff. It was very painful all day, and her temperature remained at  $99.8^{\circ}$ . She fomented it. Next morning the pain was less though the swelling was more distinct, but they gradually subsided, until in a day or two the gland was again normal.

This case constitutes the type of the recurrent enlargement of the parotid, and is characterised by absence of cause, and by the constitutional disturbance and local manifestations. In the following case there is present the possibility of some occult relationship between the local condition and the general waxy disease from which the patient suffered, though the constitutional disturbance due to the parotitis has not latterly been recognisable:—

CASE V.—A girl, aged 19, by occupation a machinist, was the subject of tuberculous disease of the hip with formation of abscesses, and subsequently sinuses. This had persisted in spite of treatment. There had been repeated scrapings; the head of the femur had been excised



in 1908, and disarticulation at the hip performed a year later. She had developed during the past three years extensive waxy disease of the viscera, with diarrhoea, albuminuria, ascites, and general anasarca.

In January 1909 the right parotid gland swelled for the first time. It came on during eating, and the swelling was pretty considerable, and interfered with her opening her mouth. No note of it was made at the time, though she was then in hospital, and the irregularity of her temperature chart cannot be said to have indicated a feverishness which might not have been sufficiently explained by her tuberculous condition. The swelling recurred frequently thereafter in the right gland, and three months later the left became affected, but never to the same extent, or with as much discomfort as the right. To begin with, the swelling of either gland did not come on invariably during mastication, but latterly was much less frequently absent. It never appeared when she was not eating, but should she feel sick and about to vomit, the swelling of one or both parotids accompanied the pre-emetic salivary flow, and was always exceptionally well marked under these conditions. At other times the swelling only came when she chewed, and especially if she ate fruit. The onset varied in earliness, but a few minutes after she ceased to eat the swelling had entirely gone. She was a somewhat pasty-faced girl of the usual type where tuberculous disease is in combination with a general waxy affection, but bright and cheerful and decidedly intelligent. There was never anything abnormal to be seen in the mouth, nor, during the swelling, could any parotid secretion be expressed from the ducts. The swelling still gave her the square-faced appearance of mumps, but apparently was accompanied by little discomfort.

From what literature I have been able to gather on the subject the parotid affection would appear to be the more common, though in my limited experience it is the reverse. Perhaps the greater size and importance of the parotid, and its greater fixity in a tenses sheath, may account for more frequent reports of its affection being recorded than of the submaxillary, where considerable swelling causes little inconvenience, and is much more likely to escape observation. Another difference between these two affections seems to be that, though the submaxillary remains single, the parotid affection tends ultimately to become bilateral. The physiological, and especially the anatomical, differences between the parotid and submaxillary glands are no mean factors in the symptomatology.

Predisposing causes are not always to be found. In none of my patients could such be certainly ascertained. One had a sore throat and cold in the head preceding her submaxillary attack,

and in my first case of parotid affection the lady was the subject of constipation, and was liable to "little blisters in the mouth." In the second of my parotid cases the commonness of waxy affection in association with wasting diseases accompanied by suppuration, and the rarity of recurrent salivary enlargement, enables one to disassociate the two conditions. Waxy degeneration does not affect epithelium, and therefore cannot be the sole reason of the salivary affection.

Dyspepsia and constipation, as mentioned by Cocking,<sup>1</sup> may be a predisposing combination, because furring of the tongue and various mouth troubles (such as aphthous patches, stomatitis, &c.) are likely accompaniments. A special predisposing cause seems to exist in submaxillary lithiasis. Multiple passage of calculi is uncommon, though in one case (a man aged 39) no less than four recurrences were noted,<sup>14</sup> but it is still more rare that the extrusion of a calculus is followed by *recurrent* enlargement of the gland. Hakes,<sup>5</sup> however, records that such occurred after the escape of a second submaxillary calculus, where apparently some subsequent cicatricial contraction had narrowed the orifice of the duct. A curious case of toleration of a submaxillary calculus during five years, in a man aged 20, and causing during that time a recurrent submaxillary enlargement, is recorded by Pravaz,<sup>19</sup> but the case is reported too soon after extrusion of the calculus to make sure that subsequently there was no further recurrence.

No writer suggests, as a predisposing cause, any inflammation of the submaxillary which could bear the same relation to it, as is claimed for mumps in the parotid affection, though the submaxillary and sublingual glands may or may not be implicated in mumps.<sup>16</sup> In the light of subsequent development one must often hesitate to admit the initial affection as true "mumps." The literature of the subject teems with such errors as regards the parotid, and my fourth case shows how readily such a mistake might be made. There is something more wanted, however, than mere local symptoms with a constitutional disturbance to prove the existence of mumps. It is desirable that a possibility of infection be elicited, or at least the existence of mumps in the neighbourhood.

Permanent enlargement of the parotids after mumps must, if it exist at all, be of the greatest rarity. Dr. John Thomson<sup>6</sup> exhibited, and has published,<sup>17</sup> a case of chronic enlargement of both parotids in a mentally defective lad of 15 years. It had existed since "an ordinary attack of mumps" seven years pre-

viously, other members of the family having had the disease at the same time. An isolated coincidence makes no law. Without mumps, however, ill-health and poor development are occasionally accompanied by an apparently symptomless enlargement of the parotids. Johnson<sup>2</sup> reports one example of this in a thin, anæmic girl aged 13, and another in an ill-looked-after and ill-nourished infant of fifteen months, but, as in Thomson's case, though the *enlargement* was present, there was no *recurrence*. It seems straining probabilities to record as the exciting cause "mumps" ten years and thirty years before the onset of the recurrent affection (Hutchinson<sup>3</sup>). At the same time, it is not possible to disassociate the inflammation of mumps from the affection of the parotid. Bouchut<sup>15</sup> is reported to have stated in a communication on the pathology of mumps in the Academy of Science that "mumps," according to his researches, really arise from retention of saliva caused by catarrhal inflammation of the parotid duct. Under the influence of this catarrh of the excretory canal a temporary obstruction is caused, which retains the saliva. In children seized with this affection while in good health the disease is not a serious one, he says, for suppuration does not take place. Though this theory will not hold good, and he is wrong in supposing that suppuration in mumps never takes place in strong children, and he seems to ignore the infective nature of the disease, it is interesting as bearing on one cause of parotid enlargement.

That mumps should be succeeded by permanent enlargement of the parotid glands is certainly more intelligible than that the enlargement should be recurrent. The fact remains, nevertheless, that many of those cases of recurrent swelling are said to have been preceded by an attack of mumps. One can call to mind in this respect many cases of glandular enlargement which ultimately proved to be tuberculous, in which the initial swelling was originally pronounced to be mumps. Before admitting that the original affection in recurrent swelling of the parotids was mumps, one requires some evidence of contagion, for probably that is the most, if not the only, characteristic attribute of mumps. The swelling, the pain and tenderness, and the alteration of the secretion, are common to both mumps and recurrent parotitis, but the interference with hearing is less common in the latter, and the fever at the commencement of mumps is apt to be higher, and it is to be noted that in mumps both glands are far more commonly affected, and the second one at a much shorter interval after the first, than in recurrent parotid enlargement.

One cannot pass from this part of the subject without reference to the condition which goes by the name of "Mikulicz's disease." This "disease" was originally described by Mikulicz in relation to chronic enlargement of the lachrymal glands, and it was subsequently found by others that the affection later involves the salivary glands, and in many cases the order of incidence is reversed. Campbell's<sup>20</sup> admirable essay on the subject is most instructive, and his *résumé* of fifty-five collected cases interesting. There is a smooth, painless, gradual enlargement of the affected glands, with no fever or malaise, but sometimes with phenomena due to lack of glandular secretion. The relationship which Campbell claims to exist between Mikulicz's disease and leukaemia and pseudoleukaemia has no bearing on the subject of this paper further than that in neither, nor in Mikulicz's disease, is there any note of *recurrence* being a feature, or even present, in the course of the affection. There may be a similarity in this, that in Mikulicz's disease the origin is presumably microbic, and its initiation often preceded by some "pre-existing lesion of the mucous membrane."<sup>20</sup>

The exciting cause of the enlargement is almost invariably the act of eating. It is natural that with increased secretion and flow of saliva towards the mouth, any localised obstruction by narrowing of the duct, either at its ostium or in its canal, should manifest itself by damming back the secretion and producing consequent enlargement and pain. In my fifth case it is to be remarked that the swelling varied in rapidity and severity with the quality of the food taken, the "obstruction" manifesting itself in proportion to the copiousness and rapidity of the salivary secretion. This patient specified apples as being peculiarly liable to produce the swelling, just as in Claisse's<sup>18</sup> case "any acid substance, particularly oranges," acted as a special stimulant. A difficulty in the passage of saliva would be more likely to occur were the secretion from any cause more thick or viscid than natural. With the cessation of eating comes diminished secretion, and the pain is relieved at once and the swelling soon after, unless the obstruction be complete. It is not likely that if the duct were at all permeable the damming back would cause permanent enlargement, but frequent recurrences, or long duration of the enlargement, might in course of time produce permanent alterations by interacinous hyperplasia and dilatation of ducts. An unusual case is recorded by Jonathan Hutchinson\* (Case II.), in which the swelling did not go down "until the patient (a woman of 54) took food." This seems to indicate a loss of tone and power of expulsive effort which



the stimulation of eating temporarily overcame, and so assisted evacuation.

In the affection of the submaxillary the onset appears to be more rapid than in the case of the parotid, though the onset never merits the term "sudden." It is not uncommon that the first attack is more severe than the subsequent ones, but it is not recorded *in extenso*. The very rapidity of onset may suggest a calculus, and it is possible that such affection of the glands may remain unpublished, under the impression that a calculus has been the cause and has been missed. Hutchinson<sup>7</sup> records such a case. The recurrence of the attacks, however, ought to raise doubts as to the correctness of the original diagnosis, and it is to be remembered that the calculus may be small and overlooked, as in Pravaz's<sup>19</sup> case. Nor is the difficulty of excluding calculus lessened by the fact that the passage of a calculus, with injury to the duct, may occasionally be the primary cause of subsequent recurrent swelling.<sup>5</sup>

Very much allied to this in its mechanism is the obstruction caused by the alteration of the secretion, the condition known as *sialodochitis fibrinosa*. The duct becomes blocked with mucopurulent secretion, and, on this being squeezed out, a flow of "fluid," "secretion," "sour water" takes place into the mouth and the swelling subsides. One cannot accept this alteration in the secretion without inquiring into its cause.

Quite recently a case, apparently of this nature, was referred to me by Dr. J. Mackie Whyte. The patient, a married lady, aged 33, was the subject of recurrent swelling of the left parotid gland during twelve years, though always of a mild type. Her family history is good, and her personal history unexceptionable. She had had no previous illness, had borne two children, and had no history of gastro-intestinal derangements. She remembered the initial attack well, because she was preparing to go to a party when, "in a minute," the swelling came on. It was not accompanied by any pain, nor malaise, nor feverishness. It seems to have reached its maximum rapidly, and then during the following three days gradually subsided. It recurred thereafter at intervals of three to eight weeks. The attacks had no relation to menstruation, and she could never attribute any cause for an onset. Each attack had been much the same as, but never worse than, the first. Sometimes she feels swelling over the malar rather than the parotid itself, and this I can confirm from my own observation, and sometimes she feels the swelling over the horizontal ramus in

front of the body of the lower jaw. At times she feels her face "like a drum, tense and strained, around and behind the ear," and when this has lasted some time a gush of saliva "with a slightly sour taste" takes place into the mouth and immediately she gets relief. She has seen the saliva rush into the mouth, and, so far as her observation goes, it is normal in appearance and consistency. She is never able to produce this flow by pressure or suction. It is to be observed that there are here, perhaps, two conditions, the former being characterised by a recurrent swelling of the face in parts not anatomically closely corresponding with the area occupied by the parotid gland, the latter being characterised by an undoubted involvement of the gland and a retention of secretion. There is another point of great interest. The former variety of swelling seldom comes on during the day, but is generally there when she rises in the morning. It gives her no discomfort, and she does not know it is there until she looks in the glass, when she can verify the observation by touch, and she says the skin looks shiny and feels slightly hot, and there is never a subjective escape of saliva during its existence nor with its subsidence. The latter variety comes on much more frequently during eating than at any other time, is characterised by more discomfort, and disappears with a salivary flow. Its onset, too, is very frequently accompanied by a most uncomfortable itchy feeling at a localised spot rather more than an inch in front of the lower part of the external auditory meatus; in other words, at the commencement of the parotid duct. Her teeth are good. The papilla and the submucous course of the duct are more pronounced than on the opposite side. Six years ago she was for a time under the care of Mr. J. H. Nicoll of Glasgow who probed the duct and did not find any calculus. He considered the case to be one of angioneurotic oedema, and I believe this to be the explanation of that variety of swelling to which she is liable, which does not correspond with the parotid gland, gives no discomfort, and is not followed by a salivary flow: but to explain the syndrome which constitutes the other variety of swelling, we are compelled to consider it a sialodochitis fibrinosa. It differs from true recurrent parotitis, in that its original onset was extremely sudden, the swelling has never been accompanied by any constitutional disturbance, and its subsidence is synchronous with a sudden copious flow of saliva from the duct.

Morestin,\* in Dentu and Delbet's *Surgery*, contributes a special paragraph on "Inflammations limitées aux conduits excréteurs des

glandes salivaires," naming each "stenonitis" and "whartonitis." Of the former he refers to a case recorded by Demarquay in 1856, where the parotid duct was blocked with pus and distended with secretion and gas, and two cases under Chassaignac which simulated parotitis, but the inflammation and suppuration were limited to the excretory ducts. He mentions an observation of Terrier's where retention was caused by an aphthous patch at the opening of the parotid duct. The submaxillary condition he ascribes to any lesion at the ostium of the duct, and says that a simple whartonitis may result in the formation of a plug of epithelial cells and mucus which may produce temporary obstruction, and the escape of which is quickly followed by relief of the symptoms. Digital pressure on the gland or even strong suction by the mouth<sup>10</sup> may be sufficient to produce the desired clearing of the duct. Similarly there may be alteration in the secretion escaping from the parotid duct. Johnson's<sup>2</sup> patient had ropy mucus which could be squeezed out by pressure. He considers that the swelling is caused by "interference with the escape of the gland's secretion due to the inflammation of the lining of Stenson's duct." The socia parotitis alone may be affected, because it has a small duct of its own entering the main duct. In Kussmaul's case a traumatism was suggested as the cause, but the later bilateral affection made this hypothesis untenable.

Rise of temperature at the commencement of the attack seems to be a feature in the typical parotid affection. This it has in common with mumps, but the feverishness is rarely so high in the former, whereas relapses, though known in the latter, do not continue through a succession of years, as recurrent swelling of the parotid may. It is not usual to find the temperature rise to 103.6 F. as in Johnson's<sup>2</sup> case, but rather to find, as recorded by Hutchinson<sup>8</sup> (Case I.), that the initial onset is accompanied by "a sharp feverish attack," while subsequent recurrences are preceded by malaise and "aching all over," and this coincides with my observation. Kussmaul<sup>11</sup> states that in his patient there never was fever, but it is not clear that his observation exhausts the details of the initial affection.

Useful generalisation can scarcely be made from the small number of cases recorded. Out of twenty-two, including my own, the parotid was affected in equal frequency with the submaxillary. Of the former, eight were females and three were males, and of the submaxillary affection, seven were males and two were females, while in two cases the sex was not specified

in the reports. When the age has been stated, the parotid has been affected between the age of 26 and 54 (four of these were below 30, three below 40, one below 50, and one below 60). In Johnson's<sup>2</sup> (Case I.), a female, aged 13, had one parotid affected. In this case the rapid onset, with feverishness, the duration, and absence of suppuration make it probable that it was the first appearance of what would afterwards become a recurrent parotitis. In the submaxillary affection, if we exclude a child of 9 years,<sup>5</sup> where the condition followed the passage of calculi, and Pravaz's<sup>19</sup> case, aged 15, also due to the presence of a calculus, the ages given are 23, 24, 30, 40, 44, and there are other four recorded as "adults" merely, the ages not being stated. The conditions, apart from an occasional accidental occurrence, such as a calculus in youth, would seem to be one of adult life. Indeed it is in adult life, when nervous affections are common, when secretions are apt to undergo alteration, when there may be dyspepsia, stomatitis, and carious teeth, and when the tissues are becoming less resilient, that one would expect to find conditions favourable to the development of recurrent swelling of the salivary glands.

It is natural that an affection of the salivary glands should produce symptoms due to interference with their secretion. Intermittent ptyalism is of very rare occurrence, and probably associated with some nervous disturbance, as in a case recorded,<sup>13</sup> which existed for five years in a female melancholic lunatic, aged 38. The other extreme is not nearly so uncommon, where the mouth is affected by extraordinary dryness. On this condition the name "xerostomia" has been bestowed. The dryness may be the only symptom complained of, and there is evidence that its causation may at any rate sometimes be central. The milder forms of mouth dryness are not at all uncommon, and as they are usually accompanied by abnormal sensations in and about the tongue and fauces, such patients come for advice on account of their fear of cancer. I do not have notes of such a case under 45 years of age; generally they are much older and edentulous, and the duration alone of the symptoms at once leads one to doubt the possibility of malignancy, even before examination. The tongue is clean, but redder and drier than normal, and a history of variation in the severity of the symptoms is generally elicited.

It seems that prolonged xerostomia is accompanied sooner or later by enlargement of the salivary glands. Thus Battle<sup>4</sup> records



the case of a woman, aged 54, whose xerostomia had existed three years before enlargement of the parotids appeared. In Fraser's<sup>9</sup> case all the salivary glands were affected (as well as the lachrymal and sweat glands), but only the parotids are referred to as undergoing enlargement, and that only slightly, though the xerostomia was very severe. In Chappell's<sup>10</sup> first case xerostomia had existed for four years before the parotids enlarged, and enlargement of the submaxillary glands followed later, while subsequent death from paralysis and coma suggested a central lesion; but in his second case, a woman of 60, with xerostomia, there was no enlargement of any gland. *Per contra*, an affection of the salivary glands or parotids alone for a sufficiently long time would likely result in xerostomia. Hutchinson<sup>8</sup> records the case of a lady, aged 52, whose swelling of the parotids had recurred during twenty years, and the enlargement only became permanent after the supervening xerostomia had existed for four years. In Fraser's<sup>9</sup> case of xerostomia both parotids were swollen, though unequally. In such cases, as there is an absence of secretion in the parotids (and it may be in other secreting glands), the enlargement cannot be looked upon as due to retention. Fraser's patient had several attacks of temporary enlargement, and though there was evident absence of secretion, it is extremely interesting to note that "on one occasion, eight hours after one-sixth of a grain of pilocarpin had been injected subcutaneously, both parotids become enlarged, painful and tender, and continued so for five days, and during the first forty-eight hours of the parotitis the general temperature was pyretic"—an exact counterpart of the initial attack in recurrent parotitis. Fraser concludes that the glands and ducts are not "permanently or importantly injured." To indicate the extensive nature of the affection, Fraser proposes the name "stomo-rhino-ophthalmo-xerosis." In Chappell's<sup>10</sup> case of somewhat similar disease both parotids "would suddenly enlarge at times, and after two or three days gradually subside." This apparently resulted in a permanent enlargement, and the submaxillary glands became similarly affected. In Battle's<sup>4</sup> case, also, both parotids were symmetrically affected.

In these cases the xerostomia, not the swelling, was the chief symptom, though the recurrent enlargement was undoubtedly a feature; and indeed it appears that in unilateral affection of either gland, xerostomia is not complained of. The other parotid rarely escapes the inflammation in mumps, yet dryness of the mouth is not a common feature, though it may exist, and hypersecretion

even is known to have been, though rarely, present.<sup>16</sup> The inflammation alone would not account for the xerostomia. In one case the xerostomia (Hutchinson<sup>8</sup>) was worst during exercise, an unusual occurrence, which I suggest may possibly be associated with the drying of the mouth by increased rapidity of breathing. It cannot be denied that a central origin might account for this, and also explain another case of Hutchinson's<sup>8</sup> in which the recurrence was liable to be brought on by fatigue. Perhaps a similar association might be evidenced where the attacks were accompanied with irritability of the bladder, polyuria, and frequency of micturition. It is interesting to note that one of Chappell's cases<sup>10</sup> was associated, when severe, with increased micturition.

Reference has been made above to the tendency unilateral recurrent parotitis has to become bilateral, but I have been able to find no record of bilateral submaxillary affection. Another point of difference between the affection of these glands is that, unless the submaxillary affection be extraordinarily acute, there is no constitutional disturbance; whereas in the parotid affection constitutional disturbance is the rule, at least in the initial attack. The duration of each attack is very variable—from a few hours or less to a week or two or even longer.

The interest of the condition does not lie in the treatment, for that appears to be a matter of little moment. Should the attack be exceedingly acute, incision may be necessary, and the absence of specific inflammatory affection seems to make recovery strikingly rapid and complete. Incision was obviously called for in Demarquay's case, where the duct was distended with purulent secretion and gas. In one case Hutchinson<sup>7</sup> adopted this treatment under the belief that the retention was due to a calculus, and he writes that he had never had a case of inflammatory enlargement in connection with the submaxillary where recovery was so rapid, complete, and permanent. He recommends probing the duct, which, if obstruction existed, would be sure to prove beneficial, as it would ensure the evacuation of the contents of the passages more efficiently than compression or suction, though less so than incision. In acute cases Morestin<sup>3</sup> and others recommend catheterism of the duct, and in chronic cases the injection of iodine solution along the canal. It would seem reasonable that the avoidance of anything which would stimulate, and the exhibition of internal drugs or local applications likely to diminish the gland's secretion, might exert a beneficial influence; but certainly

in none of my cases was surgical interference ever indicated. Indeed the indications for surgical treatment are obscured by the confusion which exists as to the varieties of salivary glandular swellings.

In conclusion it may be stated that intermittent swelling of the salivary glands is due to—(a) Causes connected with perverted secretion: (1) sialolithiasis; (2) sialodochitis fibrinosa; (3) primary xerostomia. (b) Causes connected with the ducts: definite narrowing of the ostium due to (1) trauma (e.g. calculus); (2) ulceration (e.g. stomatitis). (c) Causes other than the above, apparently in connection with the glandular function but not yet pathologically defined.

It is under the last category that my cases must come, but it is a lame conclusion which submits that the condition is unexplained. I have, however, no explanation to offer. The contribution is from a clinical standpoint only, for the cases are few and far between, and do not lend themselves to pathological or chemical investigation.

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## CLINICAL RECORD.

ON MASSAGE OF THE HEART IN CARDIAC ARREST  
DURING ANÆSTHESIA, WITH NOTES OF A SUCCESS-  
FUL CASE.

By ALEXANDER MILES, F.R.C.S.,  
Surgeon, Royal Infirmary.

THE following case illustrates the advantage of direct massage of the heart in cases of cardiac arrest occurring during the administration of a general anæsthetic.

The patient was a man, æt. 30, who for ten years had suffered from symptoms which pointed to the presence of an ulcer in the duodenum. In March 1910 he consulted Dr. H. G. Langwill, who advised operative treatment.

On his admission to the Royal Infirmary he presented the familiar appearance of a chronic dyspeptic, but in other respects was in good health. He had no cardiac lesion recognisable by ordinary clinical methods. The only unsatisfactory fact in his history was that at one time he had been rather free in the use of alcohol.

At the operation the diagnosis was confirmed by finding in the first part of the duodenum an indurated ulcer which obstructed the pyloric orifice.

On attempting to turn up the stomach and transverse colon in order to reach the posterior wall of the stomach, it was found that the lower border of the great omentum was firmly adherent to the parietal peritoneum along a line which ran straight across the abdomen a short distance below the navel. It was therefore necessary to divide the omentum in sections and secure the vessels by ligature—a step which to some extent prolonged the operation. Further delay was occasioned by the fact that the loop of jejunum which it was desired to unite with the stomach was acutely kinked, firm adhesious binding together the approximated convex surfaces of the bowel. These adhesions having been separated, a posterior gastro-enterostomy was completed.

Throughout the operation, which up to this point had occupied about thirty-five minutes, the patient took the anæsthetic (chloroform) badly. As frequently occurs in cases of long-standing ulceration, there was great difficulty in obtaining complete relaxation of the muscles of the upper part of the abdomen, even when the anæsthetic was pushed to the utmost limit of safety.

The last stitch of the continuous suture closing the peritoneum was being passed when the abdominal muscles, which up to this moment



had been rigidly contracted, suddenly relaxed and became perfectly flaccid. The movements of respiration stopped, the oozing from the divided vessels in the wound ceased, the face became deadly pale, and the pupils dilated widely. The pulse at the femoral was imperceptible, and, in a word, the patient was to all intents and purposes dead.

The anæsthetist immediately lowered the head of the table and commenced artificial respiration, and a hypodermic injection of ether was given. The peritoneal suture was unlaced sufficiently to admit my right hand into the abdomen, and with it I grasped the heart, which was felt through the relaxed diaphragm as a large firm object having a consistence very like that of the liver. It was perfectly still. After squeezing it firmly once or twice I recognised that it was being emptied, as it became softer and more flaccid, but no contraction of its muscle could be detected. The right hand was then withdrawn, and the left introduced and laid flat against the heart, while with the right hand firm pressure was made over the lower part of the chest, and it was at once evident that the compression of the whole heart was being effected more satisfactorily. After several compression movements had been made a faint tremor was felt in the heart muscle, and after a few more a series of small tumultuous contractions took place. These were repeated several times before the heart began to beat rhythmically. At first there were several regular forcible beats, followed by a number of small inco-ordinated contractions, but gradually the beat became fuller and more regular, although it was abnormally slow.

With the restoration of the circulation the other alarming symptoms passed off; the pupils became smaller, the conjunctival reflex returned, the muscles became rigid again, and in a few minutes the danger was past.

On the night of the operation the pulse was 106—the highest point it reached during the convalescence. The patient made a normal recovery, and is now in good health.

*Comments.*—1. In this case the heart was evidently paralysed by over-distension, and the mechanical emptying of its right cavities enabled it to resume its functions. It is possible, of course, that the compression effected by properly directed movements of artificial respiration might eventually have had the same effect, but the pressure being less direct, the results would neither have been so speedily nor so certainly attained.

2. My experience in this case has led me on several occasions to compress the heart through the diaphragm, when, during an intra-peritoneal operation, signs of cardiac embarrassment have been manifest. In one case alarming symptoms rapidly passed off after the heart had been compressed several times, and in others I believe they were averted.

3. When the primary operation involves opening of the peritoneal cavity, this method of relieving an embarrassed heart has obvious advantages, and may be had recourse to without delay. When difficulties arise during an operation on some other part, however, and particularly if the field of operation is infective, some moral courage is required to adopt it, except as a last resort. In view of the extreme gravity of the patient's condition, and of the increasing number of cases in which direct massage has proved successful, it seems justifiable under the circumstances to take considerable risks.

4. That the compression of the heart may require to be continued for a considerable time before spontaneous contraction is resumed is illustrated by the case referred to on p. 65. In that case also the advantage of intravenous injection of saline solution was striking.

5. The weight of evidence afforded by recorded cases seems to show that the method adopted in the above case is superior to that of exposing the heart by resecting the costal cartilages and compressing it through the pericardium. My own experience of this latter procedure is limited to one case, in which no appreciable benefit was obtained.

## MEETINGS OF SOCIETIES.

### Edinburgh Medico-Chirurgical Society.

A CLINICAL meeting was held in the Royal Infirmary on 14th December, Dr. Byrom Bramwell, President, in the chair.

Dr. Dawson Turner showed a case of pigmented nevus and a case of port-wine stain, both being treated by radium and improving.

Dr. F. Gardiner showed a case of pityriasis rubra pilaris.

Dr. J. V. Paterson showed a case of dystrophia epithelialis corneae and a case of very advanced arterio-sclerotic changes in the retinal vessels of the left eye.

Dr. Edwin Bramwell showed a case of Brown-Sequard's paralysis due to a bullet wound in the neck. There was paralysis with loss of sensibility to touch, pain, temperature and vibration in bone, as well as diminished sweat secretion, all on the same side as the lesion.

Dr. Norman Walker showed a case of actinomyces. The ray fungus had been readily found at first, but had never been found again since treatment had been begun. Dr. Walker also showed a case of multiple tumours of the skin, probably sarcomatous.

Dr. G. A. Gibson showed a case of partial acromegaly in which the bony enlargements were limited to the cranium and face. Dr. Gibson also showed a case of patent arterial duct.

Professor Sir Thomas R. Fraser showed cases of beri-beri, illustrating the atrophic and the oedematous varieties.

The President showed a remarkable nervous case. This was a robust-looking man of 29, who began to experience difficulty in moving the muscles of his limbs, face, and tongue. There had been three attacks of difficulty in swallowing. All attempts at movement were accompanied by remarkable spasm, which passed off in attempting further movement. The President also showed a patient with myxoedema which had been complicated by ascites. The latter had disappeared entirely after being once tapped.

Mr. Wilkie, for Professor Caird, showed a patient after partial gastrectomy for carcinoma of the stomach which had been adherent to the pancreas, and a patient after removal of half of the stomach, a portion of liver, and part of the transverse colon for a large carcinoma of the body of the stomach.

Professor Alexis Thomson showed a patient after removal of an impacted stone from the lower end of each ureter by the vesical route, and a patient after resection of the upper part of the humerus for periosteal sarcoma. Recurrence had taken place in the lower half of the humerus, which had also been resected and part of the fibula put in its place. The first operation was performed over a year ago.

Mr. Wade, for Mr. Wallace, showed a case of "surgical kidney," and a patient after excision of an annular epithelioma of the upper part of the œsophagus. The upper end of the œsophagus had been fixed to the muscles and skin and a tube introduced.

Mr. Stiles showed a boy after operation for a very large congenital hydronephrosis. The extra-peritoneal operation had been performed, but Mr. Stiles was convinced that the transperitoneal operation was the easier one. Mr. Stiles also showed a patient after nephrectomy for acute infection of a hydronephrotic kidney.

Mr. George Chiene showed a patient after operation for rupture of an ovarian pregnancy. The rupture had taken place at the side of the ovary next the uterus and away from the Fallopian tube. Chorionic villi were found on microscopic examination.

Mr. J. W. Struthers showed a case after nephrotomy for essential hæmaturia. Nothing was found at the operation. The kidney was stitched up and the hæmorrhage afterwards completely stopped.

Mr. Wade showed a patient three months after excision of the diaphysis of the ulna for acute infective osteomyelitis. There was complete osseous regeneration. Mr. Wade also showed a boy, aged 4 years, after operation for an extremely mobile kidney.

Mr. Wilkie showed a patient after operation for perforation of a duodenal ulcer. The condition of the patient after operation seemed hopeless, but remarkable benefit had followed the intra-peritoneal administration of oxygen.

Mr. Scott Carmichael showed a patient after subperiosteal resection of the shaft of the ulna and tibia for tuberculosis, and demonstrated Ochsner's method of treating potential and acquired flat-foot.

**Edinburgh Obstetrical Society.**

THE first meeting of the session was held on 9th November 1910, Dr. Haultain, President, in the chair. The following were elected office-bearers for the ensuing session :—

*President*—Dr. Haultain. *Vice-Presidents*—*Senior*—Dr. Lamond Lackie; *Junior*—Dr. Brewis. *Treasurer*—Dr. G. Barbour Simpson. *Secretaries*—Dr. Angus Macdonald; Dr. B. P. Watson. *Librarian*—Dr. Lamond Lackie. *Editor of Transactions*—Dr. Oliphant Nicholson. *Members of Council*—Professor Stephenson; Dr. Frederick Porter; Dr. F. D. Simpson; Dr. Haig Ferguson; Dr. Wm. Craig; Dr. Lawrence Oliphant; Professor Kynoch; Dr. Kenmure Melville.

The President delivered the Presidential Address dealing with the advances in obstetrics and gynæcology as shown in the minutes of the Society. This address is published in the *Journal*.

The second meeting was held on 14th December, Dr. Haultain, President, in the chair.

Dr. Lackie and Mr. Scott Carmichael exhibited specimens.

Professor Sir Halliday Croom read a paper on "The Modern Treatment of Contracted Pelvis."

At the outset he referred to the diminution of sepsis in hospital practice, which permitted many interferences now which were impossible in the olden days, and he further referred to the fact that sepsis still continued in private practice. He thought it was useless to discuss the methods of dealing with the narrow pelvis until practitioners recognised the fact that careful and accurate measurement of the pelvis in every primiparous woman and every multiparous woman with a bad obstetric history must be carefully carried out. He referred to the fact that in midwifery as well as in general medicine preventive treatment was more important, instancing the successful prophylaxis of obstetric complications in the Pre-Maternity Home in Edinburgh. He divided narrow pelves, for all practical purposes, into three categories—first, those below 3 inches; secondly, those above  $3\frac{1}{4}$  inches; and thirdly, those between 3 and  $3\frac{1}{4}$  inches. With the first variety there was no difficulty in dealing, because in them the only treatment, when diagnosed before labour, was Cæsarean section, which, of all abdominal operations, was by far the most satisfactory. He then dealt with the question of such cases being seen late in labour, and with the field of craniotomy, which, he pointed out, is getting more and more circumscribed every day. He recommended a more general use of maternity homes and nursing homes for the treatment of all obstetric operations.

Sir Halliday Croom pointed out that with the disappearance, in hospitals, at least, of puerperal septicæmia, confidence in the forces of Nature had returned, and labour in a narrow pelvis was allowed



now to complete itself spontaneously in a great proportion of cases. This method of treatment was strikingly successful both for the mother and the child. He believed that spontaneous delivery might be looked for in cases with a conjugate of slightly under  $3\frac{1}{2}$  inches in flat pelves, and  $3\frac{3}{4}$  inches for generally contracted pelves. The Walcher position should never be omitted in these cases as an aid to the fixation of the head. The duration of the second stage of labour was to be limited only by the condition of the mother and child. The great difficulty centred round the quarter of an inch between 3 and  $3\frac{1}{4}$  inches. In that small area there was a choice of treatment. If the condition were recognised early there was the option of inducing premature labour; if not seen until term there was the choice of attempting to deliver by forceps or by some operation for the enlargement of the pelvis. The position of the operation of the induction of premature labour was that it was perfectly safe for the mother, but unfortunately accompanied by a very considerable infantile mortality. In regard to high forceps operations in narrow pelves, the mortality and morbidity to the mother was unquestionable. This was absolutely proved by statistics. The foetal mortality in these cases ran between 20 and 40 per cent. He then referred to the development of the operations for enlarging the pelvis. These operations were not uniformly safe for the children, and were not unassociated with considerable risk to the mother. The cases in which these operations were useful were those of moderate contraction in which, after ample time had been given for the head to enter the brim, it still remained unengaged. There pubiotomy might be expected to be followed by spontaneous delivery, but if necessary, and particularly if the child's life were endangered, might be justifiably supplemented by forceps delivery. He thought that no high forceps operation should be seriously undertaken unless the operator was prepared to perform one of these cutting operations if necessary. In short, the operations for enlarging the pelvis could never be operations of primary selection. They must be restricted to cases in which Cæsarean section was either not indicated or refused, and in which efforts at spontaneous delivery had failed, and the tentative application of high forceps had been unavailing.

Taking as his subject the "Mode of Action of the Foetal Structures on the Maternal Tissues and the Function of the Decidua," Dr. James Young gave a demonstration illustrated with coloured and ordinary photographs of microscopic sections with the aid of the lantern. He referred to the description of the stroma of endometrium and the menstrual changes which he has previously published. The stroma consists throughout its entire extent of a soft, easily displaceable protoplasm which is imperfectly differentiated into cellular elements. The blood-vessels are channels through this protoplasmic mass, and

their walls, intima, media, etc., show no specialisation of structure. In menstruation the fluid and corpuscular escape from the vessels is due, not to a congestive process, but to a change in the tissue protoplasm which leads to an *active* dragging out of the watery and then of the more solid elements of the blood. Sections were shown indicating the nature of this tissue change—in the premenstrual change there is indisputable evidence of an active imbibition by all the stroma elements. The ease with which the vessel walls and stroma are teased out and displaced depends on the peculiar conformation of the tissue.

In the pregnant tube, chorion-epithelioma, etc., there is a marked necrotic change in the maternal tissues. This is most evident in the vicinity of the foetal elements, and becomes gradually less and less as these are left. There is likewise a marked oedematous escape and hæmorrhage. These are most manifest in the neighbourhood of the chorionic cells, but they are also present at a long distance from these. The changes are due to the action of a substance liberated by the foetal cells which spreads in ever-widening circles into the maternal tissues. In all the maternal tissue elements in these abnormal sites of chorionic activity, *i.e.* endothelium, connective tissue, muscle, there is clear evidence of a protoplasmic change leading to a marked fluid imbibition. The vessel walls are seen, even at a long distance from the foetal cells, to be teased out, and this is dependent on the active tissue imbibition. In later stages in thick-walled vessels, and early in fine vessels, this active dragging of the fluid into the tissues is followed by a blood extravasation. These changes become more and more marked as the chorionic cells are approached, and here they result in the well-known breaking down of the vessel walls with a flushing of the surface of the chorionic structures with foetal blood. The hæmorrhage is not due to a mere destruction of the vessel walls with a mechanical liberation of the contained blood, such as is taught.

The same tissue changes were shown in the decidua in two early ova (15 days and 17 days). Here again the oedema and hæmorrhage were most marked round the blastocyst, but they were also found at a long distance. So with other early ova described, *e.g.* Peters. It was pointed out that the structural peculiarity of the endometrium is now, in view of the main functional activity, *i.e.* pregnancy, seen to justify its existence. The oedematous escape in all these conditions, which is intimately associated with the blood escape, is due to the causes which are now well recognised to cause oedema in general, namely, an alteration in the tissue colloids, which increases their affinity for fluid.

Dr. Young pointed out that in the pregnant tube, in the uterus in chorion-epithelioma, and in the uterus in retained placental fragments, the only parts of the affected regions where the oedematous or hæmorrhagic escape had not occurred were where a decidual change in the connective-tissue cells had taken place. He stated that the

mode of action and the manner of spread of the chorionic influence, taken in conjunction with the special susceptibility of the uterine stroma, would, in the absence of a decidual change, inevitably lead to an early tearing up of the entire mucosa from fundus to internal os after the engrafting of an ovum. This consideration provided an explanation of the function of the decidua, and it also explained the necessity of the change occurring throughout the mucosa. Dr. Young stated that the decidua (1) limited the size of the implantation chamber; (2) prevented an irregular hæmorrhage throughout the mucosa; and (3) localised the expansion of the sinuses which develop in pregnancy.

Both papers gave rise to interesting discussions.

## RECENT LITERATURE.

### CRITICAL SUMMARIES AND ABSTRACTS.

#### MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.

#### NONNE-APELT REACTION OF THE CEREBRO-SPINAL FLUID.

THIS was described by Nonne at the second annual meeting of the Gesellschaft deutschen Nervenärzte (*Deutsch. Zeitschr. f. Nervenheilk.*, Bd. xxxvi. p. 55, 1909). It is a chemical reaction, and is evidence of syphilitic disease of the nervous system. A hot saturated solution of ammonium sulphate precipitates globulins and nucleo-albumins even while it is diluted with an equal bulk of fluid (—half-saturated), and thus distinguishes them from the albumins. The test is applied by mixing equal parts of the cerebro-spinal fluid under examination and a saturated solution of sulphate of ammonia. The cerebro-spinal fluid must be free from blood, because the ammonium sulphate precipitates the serum globulin and hæmoglobin the latter contains. A positive reaction is shown by cloudiness, occurring within three minutes; according to its degree it is described as slight opalescence, opalescence, turbidity. This constitutes "Phase I." of the reaction. When the fluid is filtered, acidulated, and boiled, turbidity develops in all cases—"Phase II.," which is practically unimportant. Nonne found Phase I. in 100 per cent. of his cases of general paralysis, and in 96 per cent. of cases of tabes and syphilis of the central nervous system. From his statistics he concludes—(1) that Phase I. occurs in all cases in which there is an increase of cells in the cerebro-spinal fluid; (2) that it *may* occur in non-syphilitic cases in which there is lympho-

cytosis of the fluid; (3) that it is absent in clinically cured syphilis; and (4) that it is absent in functional neuroses, even if there is a syphilitic history. He lays stress on the simplicity of the method, which requires neither microscope nor centrifuge, and requires only three minutes for its completion. It is not claimed that it is more valuable than cyto-diagnosis in the differential diagnosis of spinal or cerebro-spinal syphilis and multiple sclerosis. Phase I. *alone* is not proof that a lesion is syphilitic; it occurred in several cases of extra-medullary spinal tumour, apart from lymphocytosis, which may prove a valuable means of distinguishing tumours of the spine from syphilis of the spine. In a later communication (*ibid.*, Bd. xl. p. 161, 1910) on Phase I. in cases of spinal tumour, Nonne reports 3 fresh cases (6 in all) in which the combination of a strongly positive reaction and absence of lymphocytosis was found. The finding, however, is not invariable, hence its absence cannot be taken as excluding tumour, nor is it of any value in the differential diagnosis between intra- and extra-medullary spinal tumours.

The Nonne-Apelt reaction has been tested by Assmann (*ibid.*) in conjunction with the estimation of the cellular content of the fluid, the albumin, and in some cases Wassermann's reaction. He arrived at the conclusion that Nonne-Apelt's reaction was of great diagnostic importance. It never occurs in functional diseases, whether the patient be syphilitic or no. It is always present in tabes and general paralysis, often, but not invariably, in cerebro-spinal syphilis. It is to a large extent independent of the cell content of the fluid, and is an important characteristic of the syphilitic and parasymphilitic affections of the nervous system. It is not, however, specific, because it accompanies organic nervous disease, especially meningitis, and this independently of the degree of inflammatory reaction. Among other points on which Assmann lays stress in the diagnostic aid afforded by lumbar puncture are (1) the necessity for exact enumeration of the cells in a counting chamber. The normal number is 1 to 3 per c.mm.; values over 5 are pathological. (2) Clotting occurs in gummatous and neoplastic meningitis as well as in tuberculous and epidemic forms.

### CLINICAL DIAGNOSIS OF CANCER.

Paltauf reviewed (for the second International Cancer Conference in Paris, October 1910) the work which has been done since 1906 in connection with the serum diagnosis of cancer. He excluded from his review hæmodiagnosis in the more restricted sense (alterations in the resistance of the cells, etc.), as this was to be made the subject of a future paper (*Wien. klin. Wochenschr.*, 17th November 1910). Efforts to find a specific serum reaction have arisen chiefly along three lines—(1) Immunity reactions, depending on the absorption into the blood



of modified or foreign albumins. (2) Abnormal fermentative processes in tumours, with consequent production of antiferments. (3) General considerations as to the relation between the organism and a malignant tumours.

1. *Immunity Tests*.—With few exceptions these have given negative results. The *modus operandi* has been to inoculate animals with cancerous material, or serum of cancer patients, and then to test their serum against tumour extract or cancer serum. Complement-fixation tests have also failed, it having been found that normal and cancerous serums give identical reactions with tumour extract. Tumour extracts may be used as antigen in the Wassermann reaction and cause complement-fixation, and conversely using extract of guinea-pig's heart Forges and Salomon got a positive Wassermann in non-syphilitic patients suffering from tumour. The complement-fixation reaction, therefore, which is given by some cancerous sera is not specific. Maragliano's work with gastric juice of cases of cancer of the stomach deserves special mention. He injected rabbits with the juice; their serum was first treated with normal serum until no further precipitation occurred. The filtrate there gave a precipitate with the gastric juice from cancerous stomachs, but not with healthy gastric juice (16 out of 17 cases). These results are very striking and deserve further work.

*Anaphylaxis* has also been employed in testing for cancer. Pfeiffer and Finsterer claim positive results. They gave guinea-pigs intraperitoneal injections of cancer serum, and then injected cancer juice. This resulted in a sudden fall of temperature ( $1.5^{\circ}$  C. at least), an anaphylactic phenomenon which did not take place in controls—inoculation of guinea-pig treated in the same way with normal serum, and inoculation of untreated guinea-pig with cancer juice. They assert that this reaction is specific as between cancer and sarcoma, and between these and benign tumours. The criticisms brought against Pfeiffer's results are chiefly in the direction of denying that the fall in temperature is actually a sign of anaphylaxis. The negative results of these three sets of reactions—precipitin test, complement-fixation, anaphylaxis—agree with the fact that hitherto it has been found impossible to isolate a foreign albumin from malignant tumours. Paltauf next discusses Ascoli's meiostagmin reaction, which was recently described in this column (*Edin. Med. Journ.*, July 1910). Ascoli reports 93 positive reactions in 100 cases of tumour, Michelli 120 positive in 130 cases, with negative reactions in 10 simple tumours, and 129 out of 130 other diseases. Verson, on the contrary, only had 55 per cent. of positive results. Ascoli and Izar formulate these conclusions:—(1) Malignant tumours contain a specific lipid, which is absent from or present only in the merest traces in other organs. (2) Cancer serums react with this specific lipid differently from normal serums. (3) The antigens of different tumours—human carcinoma

and sarcoma, tumours of rats and mice—show great similarity. Paltauf expresses the view that nothing is certainly known as to the nature of the reaction. He considers that it deserves a further test.

2. *Ferment Reactions*.—The first step in this direction was the discovery by Petry that in malignant tumours there was excessive autolysis, and attempts were made to utilise this fact on diagnosis by using cancer serum and tissue juices along with peptones, and ascertaining to what extent the latter were split up. The next step was the determination of the antifermentative action of the serum in cases of cancer—the antitryptic reaction of Brieger and Trebing, which also was lately described in this *Journal* (*loc. cit.*). Paltauf apparently agrees with those who hold that the antitryptic reaction is not specific, but he regards it as a diagnostic aid of considerable value. A third step along the same line has been made by Neuberg, in his experiments as to what chemical reactions take place between blood-serum and tumour. He digested together cancer cells and cancer serum, cancer cells and normal serum, and cancer cells and ox serum, and found that after forty-eight hours the normal and ox serums had dissolved the cells to a greater extent than the cancer serum, while in the last the cells, instead of dissolving, “clumped” into masses. These results of Neuberg are very noteworthy.

3. *Other Reactions*.—Freund, starting from the fact that the occurrence of metastases varies so much in individual cases, tried to ascertain whether there existed in the blood-serum substances which were either destructive to cancer growth or favourable to cancer growth. He tested serum against emulsions of cancer cells, counting the cells in a hæmocytometer before and after incubation with serum. He found marked differences, according as the serum was derived from normal or carcinomatous patients; in the former case the cancer cells were diminished, or disappeared, while in the latter they were preserved. Autolysis and heterolysis were excluded by control experiments. Freund thereupon inferred the existence in normal serum of a substance which can destroy cancer cells. It is non-dialysable, precipitated by alcohol, thermolabile, and can be extracted by ether, from which it is soluble in alcohol. The evidence pointed to lecithin being this destructive substance. Freund also brought forward some proof that in cancer serum there is a substance which is protective to cancer cells. He also found that cancer serum gave a precipitate with cancer extract, whereas normal serum did not—a reaction he regards as specific—54 positive results with cancer serum, and 45 negative with serum of other diseases. These results of Freund agree with those of Neuberg on the one hand, and indirectly with Ascoli's meiotagmin reaction, which is an expression of the physical difference between cancer extract and normal serum, and cancer extract and cancer serum. The congruent results of three workers along different

lines lead to the hope that a practical test may emerge: unfortunately time has not yet elapsed for an extended series of confirmatory observations. Freund looks on his experiments as suggesting an acquired tendency to cancer in certain individuals.

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## SURGERY.

### REMOVAL OF AN INTRA-MEDULLARY SPINAL TUMOUR AT THE LEVEL OF THE FOURTH AND FIFTH CERVICAL SEGMENTS.

KERAGUTH and Brun (*Correspondenz. Blatt f. Schweiz. Aerzte*, No. 33, 1190) record an interesting, if not unique, case of successful removal of a tuberculoma from the substance of the spinal cord at the level of the fourth cervical segment.

The patient was a man, aged 32, who had previously suffered from phthisis. The symptoms of his affection developed gradually, and at the time of operation were roughly, a motor paralysis of the left arm and leg, with astereognosis on that side; diminution of sensibility to painful stimuli, heat, and cold from the shoulder downwards all over the right side; and partial sensory paralysis of the left arm. He had, in fact, in typical form the symptoms known as the Brown-Séquard syndrome. The patient's general condition was very much enfeebled, but his intellectual faculties were unimpaired. An intra-dural-extra-medullary tumour pressing on the left side of the cord was diagnosed. At the operation the arches of the third and fourth cervical vertebræ were removed. The dura was opened, and nothing seen but a bulging of the cord at the level of the third segment. Palpation revealed distinct induration in this region, so the pia was incised, and after further examination a small tuberculous nodule the size of a hazel nut was shelled out from the substance of the cord. The patient stood the operation well, and made an excellent recovery.

J. W. STRUTHERS.

### A METHOD OF INCREASING THE ACTION OF DRUGS PRODUCING LOCAL ANÆSTHESIA.

While comparing the action of narcotic and local anæsthetic drugs, Gros (*Munch. med. Wochenschr.*, No. 39, 1910) came to the conclusion that the effective element in a solution of a local anæsthetic salt, such as novocain hydrochloride, was the free base split off in the solution by hydrolysis. He demonstrated this experimentally with a variety of local anæsthetic salts, comparing the action of solutions of their chlorides alone, with that of solutions containing the chlorides and a small quantity of caustic soda in addition. The solutions containing the



added alkali acted much more quickly and intensely than those without it, owing presumably to the fact that the presence of the alkali liberated the base of the anæsthetic salt, and made a given quantity of novocain more effective. Unfortunately the free alkali interferes with the adrenalin, which is now universally added to solutions for local anæsthesia, and Gros therefore concluded that the best results were to be got by combining in solution a definite quantity of novocain and sodium bicarbonate. The resulting solution gave novocain bicarbonate and sodium chloride. The bicarbonate of novocain is easily broken up, and in a solution of it the maximum amount of free base is liberated by hydrolysis, while any adrenalin which is added is not affected.

Experiments and clinical observations were made by Læwen, which confirmed the theories put forward by Gros, and Læwen recommends that novocain bicarbonate should be used for local anæsthesia. He gives the following formula for powders:—Sod. bicarb. pur. 0.15 grm.; sod. chlor. 0.1 grm.; novocain 0.6 grm. One powder to be dissolved in 30 c.cm. distilled water to make a 2 per cent. solution. Adrenalin can be added in necessary amount. Other formulæ are given, which need not be quoted here. The most striking difference in the action of the bicarbonate as compared with the chloride will be found in the use of strong solutions for inducing regional anæsthesia.

J. W. STRUTHERS.

#### DISINFECTION OF THE SKIN WITH TINCTURE OF IODINE.

Grossich (*Allgemein. Wien. med. Zeit.*, No. 45, 1910) first described his method of disinfecting the skin with tincture of iodine in 1909. He has now used it for more than two years and has found that his results amply justify his belief in the efficiency of the method. In 700 cases of wounds in manual workers, in which his plan was used, primary union was obtained in all but 7 per cent., and in these some indication of infection was present when they came under observation. In 500 cases of operation wounds of all varieties, including 129 herniotomies, there was no case of skin suppuration. The method consists in freely applying the tincture of iodine to the dry skin and allowing it to act for 10 minutes. Preliminary washing is harmful, because it softens the epithelial scales and makes them swell, preventing the penetration of the iodine. If shaving is necessary it must be done without soap and water, or, when possible, the night before an operation.

[It is to be remembered that the tinct. iodi of the British Pharmacopœia is only a  $2\frac{1}{2}$  per cent. solution, whereas the German and other foreign tinctures are much stronger, being of about 10 per cent. strength.]

J. W. STRUTHERS.



## THE ORIGIN OF THE SAC IN FEMORAL HERNIA.

Murray strongly supports the view that the sac of a femoral hernia is congenital (*Annals of Surgery*, November 1910). His evidence is contained under four heads: (1) In a number of cases femoral hernia occurs during childhood, and in others it is present at birth or noticed during infancy. Of 104 cases occurring in patients under 15, 52 appeared between 1 and 10 years of age, and 9 were noticed in children below 5. (2) In 200 consecutive post-mortem examinations on persons in whom there had been during life no history or evidence of hernia, in 47 bodies femoral diverticula were present. In 14 instances they were bilateral. They invariably occupied a position exactly corresponding to that of a femoral hernia. The mouth and lumen were narrow, as if they were produced by some force pulling the peritoneum outwards rather than by a pushing force from within. (3) If the sac was acquired owing to weakness of the abdominal wall, recurrence of the hernia after operation should frequently occur, as it is extremely difficult to strengthen the abdominal wall at this point. Yet the removal of the sac alone, without any attempt to reinforce the weak point, is followed by satisfactory results. (4) If the diverticula are congenital, they are probably produced by the dragging of a crural gubernacular attachment. In this event gubernacular fibres should be found at the fundus of the sac. The following report on the sac of a femoral hernia from a male patient is positive:—"Sections of the fundus of this sac certainly show small bundles of striated muscle. They can easily be picked out by their characteristic appearance, nuclei, striated sheath," etc.

The greater frequency with which femoral hernia occurs in female patients is thus explained: Granted the presence of a diverticulum, the descent of the bowel would depend on the size of the mouth of the sac. If the sac is relatively large, the hernia may appear during infancy or childhood; if, as is more usually the case, the sac is at first small, then the bowel does not enter it until, with the growth of the individual, it has reached a certain size. In females the mouth of the sac is specially liable to widen with the lateral expansion of the pelvis which begins at puberty. A second factor is the increased pelvic pressure during pregnancy, and, in accordance with this, femoral hernia appears with greatest frequency during the child-bearing period.

JAMES LOCHHEAD.

## MASSAGE OF THE HEART IN CHLOROFORM SYNCOPE.

Depage reports an instance in which, after spontaneous cardiac contractions were absent for an hour, they recommenced with the continuance of cardiac massage and the intravenous infusion of saline

solution (*Journ. de Chirurgie*, November 1910). The patient was a boy of 15, weakened by prolonged suppuration from osteomyelitis. The anæsthetic was chloroform, and after half an hour the breathing stopped, but soon began again with artificial respiration. Later symptoms of cardiac failure set in, and artificial respiration was tried without success for fifteen minutes. The abdomen was then opened and the heart massaged with one hand below the diaphragm and the other on the chest wall. After periods of twelve minutes, and then of ten minutes, faint cardiac tremors alone could be felt, but occasionally spontaneous respiratory movements occurred, though they ceased when the compressions of the heart were stopped. At this stage normal saline was administered intravenously, and before a pint had been introduced the heart commenced to beat, at first feebly, but soon with "astonishing intensity and force." Respirations became regular, and the operation was completed. During the waking up the patient was very restless. He remained mentally torpid, and incontinence of urine supervened, but ocular troubles were absent, and there was no paralysis or contracture. The temperature rapidly rose from a low level after a second transfusion of saline. Next day he was somnolent, but he responded when spoken to. Now and again he uttered raucous cries, and ground his teeth; the pupils reacted normally, and no paralysis was present. The patient remained in this state for several days and then became worse, and nine days after the operation he died. The post-mortem examination revealed degeneration of the myocardium, fatty infiltration of the liver, extensive thrombosis of the kidney vessels, and degenerative changes in the brain comparable to those met with after temporary ligature of the aorta.

JAMES LOCHHEAD.

## OBSTETRICS AND GYNECOLOGY.

By A. H. F. BARBOUR, M.D., LL.D., Lecturer on Gynecology,  
and

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### THE DANGERS OF UTERINE FIBROIDS ASSOCIATED WITH PREGNANCY.

A FIBROID tumour of the uterus may or may not give rise to symptoms, but the occurrence of pregnancy in a uterus the seat of such a tumour is a serious complication. Fortunately women with fibroids are very often sterile, a provision of Nature for which they ought to be thankful. There are, of course, a certain number of cases in which the pregnancy goes on and the labour terminates naturally, but these must be regarded as the exception rather than the rule.

The danger to the mother from the obstruction of labour by an incarcerated fibroid in the pelvis is well known, and also the liability to post-partum hæmorrhage. During the course of the pregnancy, however, there is also danger resulting from degenerative changes in the tumour, especially necrosis or red degeneration. This is the most frequent degeneration which occurs in fibroids. Thus in a series of 179 fibroids analysed by Young and Williams (*Boston Med. and Surg. Journ.*, May 1910), necrosis was present in 19, and proved fatal in 6. The liability to necrosis is greatly increased during pregnancy and after labour and abortion. Why this should be is not quite clear, but the process runs a rapid course and may prove quickly fatal. Baer (*Amer. Journ. of Obstet.*, June 1910) quotes statistics showing that 50 per cent. of the mothers and 70 per cent. of the children perish.

The occurrence of abortion seems to be an added danger rather than a safeguard. Krusen (*Amer. Journ. of Obstet.*, March 1910) finds that in 548 cases 86 abortions with 14 deaths occurred, and in 23 cases in which abortion was induced 3 deaths occurred—truly a formidable mortality. He reports 2 cases. A patient, aged 24, had had an abortion, for which the uterus had been curetted. When seen six weeks later the uterus was large, and a soft mass was felt to one side of it. On opening the abdomen a collection of pus was found between the uterus and the bladder, and a necrotic sloughing fibroid in the anterior wall of the uterus. The abscess was drained and the uterus removed by supravaginal hysterectomy. The other case was that of a woman, seen three weeks after abortion, suffering from symptoms of sepsis and with great pain over the abdomen. A large fibroid of the uterus was found, adherent to the stomach and omentum, and so necrotic that it broke away on handling.

Baer in one of his cases cleared out an incomplete abortion from a fibroid uterus, and had to open the abdomen three weeks later on account of septic symptoms. He found inflammatory changes in the tumour and appendages. In his opinion it would have been better to have performed hysterectomy straight away without attempting to clear out the remains of the ovum. This treatment he carried out in another case. The patient when four months pregnant had an incomplete abortion, followed by raised temperature, rapid pulse, and abdominal pain. On examination the fetal membranes were found presenting at the os, but no attempt was made to remove them, as the uterus contained multiple fibroids. Supravaginal hysterectomy was performed and it was found that one of the tumours was necrotic. In a third case after an incomplete abortion from a fibroid uterus at the third month, followed by symptoms of sepsis, he carried out the same procedure, and again found the tumour gangrenous.

That this degeneration has no relation to the size of the tumour is shown by a case of Chavannaz (*Annal. de gynéc. et d'obstét.*, October

1910). The patient was 25 years of age and recently married. After six weeks' amenorrhœa she began to have abdominal pain, pain on micturition, high temperature, and rapid pulse. On examination the uterus was enlarged, and in front and to the right of it a hard mass could be felt. A diagnosis of extra-uterine pregnancy was made and the abdomen was opened. It was then found that the pregnancy was intra-uterine, and that in the anterior wall of the uterus was a small fibroid. This was shelled out, but when it was seen to be in an advanced state of necrosis the uterus was removed by supra-vaginal hysterectomy. The patient made a good recovery.

Both Baer and Krusen report other cases in which the pregnancies had gone on for a longer time before symptoms arose, but in which it was ultimately necessary to perform hysterectomy.

The occurrence of necrosis is not the only danger to which the individual is exposed. Krusen enumerates ten complications more or less frequently met with. The more important of these are: twisting of the pedicle in subperitoneal tumours, malpositions of the child, placenta prævia, post-partum hæmorrhage, spontaneous rupture of the uterus, greater liability to degeneration of the cardiac muscle. The treatment of a pregnancy complicated by fibroids in the uterus may therefore be a difficult matter, and each case must be considered on its own merits. A study of the recorded cases shows that the induction of abortion is always attended with danger in these cases and ought never to be attempted. If the pregnancy is progressing smoothly it may be allowed to go to full time and the patient delivered spontaneously or by Cesarean section, according as the tumour does not or does obstruct the pelvis. Should, however, acute symptoms arise at any time, the uterus ought to be removed without delay. The same rule applies in cases in which, after an incomplete abortion, signs of sepsis appear.

#### THE USE OF PITUITARY EXTRACT FOR POST-PARTUM HÆMORRHAGE.

Following on the observations made by Frankl-Hochwart and Fröhlich (*Wien. klin. Wochenschr.*, No. 27, 1910) on the effects of pituitary extract in causing contraction of the uterine muscle of rabbits, and rendering it more sensitive to faradic stimulation, Foges and Hofstätter (*Zent. f. Gyn.*, No. 46, 1910) have employed it in cases of post-partum hæmorrhage. They began by testing its effect in puerperal women suffering from excessive lochia. When given by the mouth, even in daily doses of 30 c.cm. of the Parke Davis solution, little or no effect was produced on the blood-pressure or on the bleeding, the only result being a slight diuresis. They then tried intra-muscular injection, and found that a dose of from 1 to 2 c.cm. in 20 c.cm. of normal saline could be given without pain or local reaction, and that



such doses produced a marked effect on blood-pressure. They have used this dose and method of administration in 63 cases, 43 with severe post-partum hæmorrhage, 8 with less severe hæmorrhage, and 13 with bleeding after abortion. They found that the relaxed uterus from which bleeding was occurring after the birth of the placenta, and which failed to contract as the result of abdominal massage, responded to this stimulus within a few minutes of the injection of the extract into the gluteal muscle. The uterine contraction was strong, and lasted sufficiently long to arrest the bleeding. Any relaxation which came on later could at once be counteracted by even gentle massage. In 3 of the 43 severe cases it failed to arrest the bleeding, but the authors have no doubt from their clinical observations that the strength and duration of its effects are greater than those of ergot. The action of pituitary extract on the uterus is very much the same as that of adrenalin, but its effect on blood pressure is less strong although more lasting. In cases which do not respond within a few minutes to pituitary, ergot may be given in addition.

These results confirm those of other writers such as Bell (*Brit. Med. Journ.*, December 1909), who has had successful results in several cases. It would thus appear that we have in pituitary extract an important addition to our methods of treating this formidable complication of labour.

#### PREGNANCY FOLLOWING SALPINGECTOMY.

Cases have been from time to time recorded where pregnancy has occurred after ablation of the Fallopian tubes. Some of these are cases in which the salpingectomy was done for the purpose of sterilising the patient because of some condition rendering pregnancy or labour dangerous. In such the occurrence of conception is a serious matter, and various modifications have been devised to render the sterilisation more certain. Simple ligature, ligature at two places with excision of the intervening portions, and complete removal of the tubes at the isthmic area have all failed. Of late years the method generally adopted has been the excision of the tube out of the angle of the uterus, followed by careful stitching of the muscle and peritoneum so as to close up completely the uterine angle. A case recorded by Polak (*Amer. Journ. of Obstet.*, October 1910) casts doubt on the absolute certainty of even this last method. The patient's right tube was excised by a wedge-shaped incision out of the angle of the uterus and the uterine angle carefully stitched. Six months later she was operated on for a ruptured extra-uterine gestation which was situated in the right cornu of the uterus. It is possible that the ovum had migrated across the uterine cavity from the left tube, but it is also possible that it had got in owing to the uterine angle opening up. Another case

of Polak's, in which both tubes had been removed through their isthmic portions, developed an interstitial pregnancy, and a third, a normal intra-uterine one, which went to full time. In order further to minimise the possibility of pregnancy in such cases, Asch (*Zent. f. Gyn.*, No. 45, 1910), after ligaturing and dividing the tube at the junction of the inner and middle thirds, implants the uterine end between the two layers of the upper part of the broad ligament and stitches the peritoneum over it. There is less likelihood of this loose peritoneum opening up than that covering the uterus, and the distal end of the tube can be left open, so that there is no danger of a hydrosalpinx developing.

#### THE SENSIBILITY OF THE FEMALE PELVIC ORGANS.

In the course of a Wertheim operation for prolapse performed under local anæsthesia Bröse (*Zent. f. Gyn.*, No. 47, 1910) was able to note the sensibility of the internal pelvic organs. The anterior vaginal wall and vaginal portion of the cervix were infiltrated in the usual way with a novocain-adrenalin solution. The vaginal wall was split and the bladder dissected off the front of the cervix without pain. A further infiltration was made in the cellular tissue below the utero-vesical reflexion of peritoneum, and the peritoneal cavity opened painlessly. When two fingers were introduced through this opening into the peritoneal cavity the patient complained of a feeling of nausea. The pulling forward of the uterus into the incision and out into the vagina produced pain described as down-bearing in character and like that of labour. But after the uterus, tubes, and ovaries were in the vagina they could be handled freely without causing the patient any discomfort whatever. The application of hot and cold instruments and of firm pressure produced no response. The tubes were excised out of the angle of the uterus, and the divided mesosalpinx and uterine angle stitched quite painlessly. There was again some pain on pushing the uterus back, but none during the stitching of it to the anterior vaginal wall. These observations confirm for the pelvic organs what has already been established regarding the abdominal organs, namely, that they are, at any rate in their normal state, insensitive to ordinary stimuli.

MEDICAL JURISPRUDENCE.

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BISMUTH POISONING.

BISMUTH poisoning, with severe symptoms or even death, has of late become more frequent since the introduction of bismuth preparations for X-ray diagnostic work and as a surgical dressing material. The use of emulsions may occasion sudden death, as in a case reported by Desternes (*Bull. de la Soc. de Radiol. de Paris*, 1910), in which a man with a high degree of œsophageal stricture from malignant disease was being screened. Without any cry or cough he suddenly ceased to breathe and in a few minutes was dead. The sectio revealed the presence of some 50 grms. of bismuth emulsion in the air-passages, a small fistula having opened between the œsophagus and the trachea just above the bifurcation.

More commonly, however, the symptoms are those of acute or subacute poisoning, and they follow only on the employment of bismuth subnitrate. Bismuth carbonate or oxychloride may apparently be used, at all events on a single occasion, in large amounts with impunity. Poisoning from the use of subnitrate emulsion in screening alimentary cases is recorded, amongst others, by Schumm and Lowey (*Fort a. d. Gebiet. d. Röntgens.*, 1910); from injection into an abscess by Reich (*Bruns Beitr. z. klin. Chir.*, November 1909); and by Windrath (*Med. Klinik*, No. 19, 1910) where a paste was used as a dressing after scalding in children.

The symptoms, which as a rule come on some days after administration, are considered by most writers to fall into two groups:— (1) Those due to the metal bismuth—they are most prominent in cases of external application, and are, stomatitis with bluish or brownish metallic tinging of the gums, dysphagia, diarrhœa, nephritis, fever, and a macular or pustular rash. (2) Those due to nitrite poisoning—most in evidence where the administration has been internal, but which may also be present in cases of external application or injection into abscesses. The most striking of these are methæmoglobinæmia, destruction of red blood corpuscles, and muscular cramps and convulsions. Death may follow in anything from a few days to a fortnight.

Windrath, who in his paper gives a short review and bibliography,

considers, however, that all the symptoms may be attributed to metallic poisoning.

Marre and Taillandier (*Compt. rend. de la Soc. de Biol.*, No. 6, 1910) have investigated the point whether, as has been suggested by Brauer, nitrites are formed from bismuth subnitrate under the influence of Röntgen rays. They have found that *in vitro* nitrites are always formed from the subnitrate of bismuth when brought into contact with faecal matter, but that, when exposed to the rays, the formation is not only not increased but is markedly diminished. They agree with Böhme's view that intestinal organisms, especially *B. coli*, play the chief part in the nitrite formation.

#### INTRA-TRACHEAL INSUFFLATION FOR NARCOSIS IN INTRA-THORACIC SURGERY, AND FOR ARTIFICIAL RESPIRATION, MORE ESPECIALLY IN STRYCHNINE POISONING.

The procedure described by Meltzer (*Berl. klin. Wochenschr.*, p. 566, 1910) which he designates intra-tracheal insufflation promises to be of considerable practical value, not only as a mode of carrying out prolonged artificial respiration, but of inducing narcosis, especially in intra-thoracic surgery. The technique is comparatively simple. After etherisation (if the subject be not unconscious) a gum-elastic or hard rubber catheter or a piece of narrow stomach tube is introduced through the larynx until it reaches a point just above the level of the bifurcation of the trachea. The outer end of the tube is tied on to the mouth gag and then connected up with a T-tube, one limb of which goes to a mercury manometer, the other, by means of a long tube, to a Wolff's bottle. This bottle (containing ether if being used for narcosis) is in connection, on its other side, with a bellows, and is arranged with two T-tubes, rubber connections, and clips, so that the air coming from the bellows may be directed either through the flask or directly to the trachea. It is advisable to have the air between the bellows and the flask filtering through cotton-wool. The air is pumped almost continuously at a pressure of from 8 to 12 mm. Hg., but it may rise even to 30 mm. It is advisable to stop pumping for a few seconds once or twice each minute to allow of full out ventilation from the lungs. The interchange of respiratory gases is a continuous one, not intermittent, and is carried on without the help of the subject's respiratory movements, but it has been demonstrated to be so complete that fully curarised animals can be kept alive for hours by this method. The method has the further advantages that it can be kept up without exhausting the operator, and by a non-skilled person, once it has been started, and that there are no ill after-effects on the subject, either as a whole or in the respiratory organs in particular. Ether narcosis by this method requires very little ether, and is exceedingly safe; indeed



the author could not succeed in killing dogs with ether administered in this way. The outdraught of air through the upper air-passages keeps them clear of all obstruction, and prevents any foreign, *e.g.* vomited, material from getting into the larynx. The method promises to be of most value in intra-thoracic surgery, on account of the raised intra-pulmonary pressure and absence of movement in the chest, and it has already been used in human beings with success by Elsberg at the Mount Sinai Hospital, New York. Shacklee and Meltzer (*Berl. klin. Wochenschr.*, p. 1776, 1910) have been working experimentally at the treatment of strychnine poisoning with the aid of this method. Intra-tracheal insufflation alone will not save the life of an animal which has received a lethal dose of strychnine, nor even lessen the convulsions. But by giving curare, so as to paralyse completely all movement, the convulsions are stopped and the animal can be kept alive by intra-tracheal insufflation until the strychnine is excreted from the system. Thus they found that whereas 0.4 mg. of strychnine per kg. of body-weight is a certain lethal dose in the dog, with curare and intra-tracheal insufflation they were able to bring about recovery in more than half of a number of dogs who were given twice this dose. It was found necessary to keep up the artificial respiration for periods of from 3 to 7½ hours. To aid the elimination the animals were also transfused intravenously with Ringer's fluid. As this helps to get rid of the curare also, it is necessary to give sufficient of the latter drug or the convulsions may come on again.

#### POWER OF SPEAKING AFTER INJURIES TO THE LUNG.

The question recently arose in connection with a case whether certain screams which were heard were uttered before or after the infliction of the injuries, which, post-mortem, were found to include several deep stabs into the lungs. As there seemed to be no definite data available on this point, Loewy and Fraenkel (*Zeitschr. f. Medicinal-beamte*, p. 465, 1910) have investigated it experimentally. Their experiments were of two types:—(1) On dead bodies the air-pressure in the trachea was measured when the chest was firmly compressed—(a) with the thorax intact; (b) with an open wound on one side of the chest; (c) with, in addition, several incisions made into the exposed lung. These experiments, although not conclusive, as the conditions are scarcely comparable with the natural voice production, have a certain value, as they showed that, although the air-pressure was lower in the two latter cases than where the thorax was intact, there was always such a pressure as would probably be quite sufficient for loud intonation. (2) Direct experiments were made on animals to see what power they had of crying after injury to the lungs. From these it was made abundantly clear that a penetrating wound of the

lung, so long as the thoracic wound remained closed, made very little difference to the loudness of the cries uttered. Even when the thorax was open there still remained sufficient air-pressure in the other lung to allow of powerful vocalisation. Only when the main bronchus to one lung or to one lobe was opened, and opened widely, was the loudness of the cries much diminished. Such a condition, however, is hardly likely to arise in actual practice.

### ELECTRIC SHOCK.

The widespread use of powerful electric currents in all manner of industrial activities leads to frequent serious and often fatal shocks. Stanton and Krida (*Med. Record*, 19th November 1910) give a very good summary of our knowledge regarding the effects which follow and the causes of death which results from powerful commercial currents, and formulate a rational procedure to be carried out in treatment. The lethal effects of these currents may be summed up under three heads:— (1) Actual destruction of tissue, such as burns, and sloughing far beyond the original visible limits of injury. This is of minor importance as a cause of death. (2) Interference with the action of the heart. This is one of the commonest causes of death, especially when relatively low tension currents are encountered. Such currents passing through the heart interfere with the normal rhythmic contraction and throw it into a state of fibrillary contraction. The ventricles are particularly susceptible; a current of even one volt when directly applied to them may induce fibrillary contraction. The markedly varying results from accidental shock may be, at least in part, accounted for by the poor contacts often formed, and also by the arcing tendency of high tension currents, so that portions of the body serve only as a means of completing the arc, the current not passing through the heart at all. In experimental work on animals great variation is also seen, as the susceptibility of different animals varies exceedingly, the rat, for instance, being almost immune for cardiac paralysis for direct currents up to 550 volts. In the case of alternating currents those of low frequency (25 to 150 cycles) are very much more liable to cause fibrillation than high frequency (1700 cycles and over) currents of similar voltage. Very high tension currents (4800 volts) may even re-establish heart-beats in a heart previously paralysed or in fibrillary contraction, if applied before the blood-pressure has fallen to zero. (3) Arrest of respiration by paralysis of the nerve centres. The effect of both direct and alternating currents on the central nervous system is practically in direct proportion to the strength of the current used and the duration of the contact. As the tension increases the effect on the heart becomes less pronounced, that on the nervous system more and more certain, though if contact is prolonged the heart

is also stopped. Any current over 600 volts may cause almost instantaneous unconsciousness and often a respiratory paralysis, which appears to be the result of a profound anesthesia, comparable to one due to an overdose of  $\text{CHCl}_3$ .

*Treatment.*—The cases with ventricular fibrillation are apparently quite hopeless from the very first with our present methods, although there seems a possibility that resuscitation might be possible within the first five minutes (*i.e.* before the brain has been too long anæmic) by the combined use of high tension contacts and injections of saline and adrenalin by Crile and Dolly's method. In cases of simple respiratory paralysis the patient may be kept alive by artificial respiration until the nervous system recovers from the effects of the shock. This may have to be maintained for hours, and will probably always have to be started by manual means, but the author recommends the use of a method such as Meltzer's intra-tracheal insufflation referred to above. A point in favour of this method is the fact that all manual methods require energetic manipulation of the chest wall with more or less accompanying massage of the heart, and the experimental work seems to show that any traumatic impulses transmitted to a heart through which a current has just passed may tend to establish fibrillary contractions in the heart which would otherwise not occur.

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## DISEASES OF THE EAR.

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### THE EUSTACHIAN TUBE.

ALTHOUGH it has long been recognised that the great majority of diseases of the middle ear are due to the extension of inflammatory processes from the nose and naso-pharynx along the Eustachian tube, our efforts to cure these diseases have too often been confined to the more posterior and accessible parts of the middle ear cleft (tympanic cavity and mastoid antrum). During recent years, however, an increasing amount of attention has been paid to the naso-pharynx, and it has even been said in America that some day the laryngologist will do away altogether with the necessity for the aurist. This day, however, is not yet, and in the meantime 5 per cent. of school children suffer from deafness, while one child<sup>1</sup> out of sixty has otorrhea. It cannot be stated too emphatically that the middle ear cleft extends from the pharyngeal orifice of the tube back to the most remote mastoid air-cell,

and that this cleft is lined by one continuous layer of mucous membrane ; it is this layer which brings diseases of the ear into the sphere of the laryngologist, for diseases of the external ear belong mainly to the dermatologist, while those of the internal ear are largely problems for the neurologist. The Eustachian tube consists of two portions—cartilaginous and bony—which meet at the isthmus at an obtuse angle : Yankauer<sup>2</sup> points out that the cartilaginous part is entirely outside the skull, and is acted on by the muscles of the tube. Politzer<sup>3</sup> states that the tube is normally closed in its middle part, but during the act of swallowing the cartilaginous part is raised by the levator palati, whilst the outer wall, which consists almost entirely of fibrous tissue, is drawn outwards by the tensor palati (dilator tubæ). The ciliated mucous membrane lining the cartilaginous tube is thrown into folds, and the submucous tissue contains numerous mucous glands. The pharyngeal orifice in the adult is considerably below the level of the tympanic—Kerrison<sup>4</sup> gives it as 14 mm., whereas Brühl and Politzer put it at 25 mm. ; the pharyngeal opening is closely related to the fossa of Rosenmüller—a common site for adenoid growths, which may interfere mechanically with the movements of the tube. Adenoids are often left behind in this region when the central mass is removed by operation, and this fact may account for the frequent persistence of Eustachian obstruction after operation. The posterior ends of the inferior turbinal bodies are often considerably enlarged, and may then obstruct the Eustachian orifice. On the other hand, cases have been recorded in which the Eustachian cushions themselves were so enlarged as to interfere with nasal respiration. The bony or tympanic part of the tube is related above to the canal for the tensor tympani muscle, and to the middle fossa of the skull ; the floor of the bony tube is the roof of the carotid canal, and frequently contains recesses (tubal air-cells). The mucous membrane lining this region is of the cubical ciliated variety. It is important to remember that the tubal opening is nearer the roof than the floor of the tympanic cavity.

Kerrison points out that the Eustachian tube in the infant is horizontal while the pharyngeal orifice is at a level below that of the hard palate ; the tube is straight and much shorter than in the adult, but the calibre is the same, so that relatively the tube is wider and consequently more liable to infection. In a recent paper Milligan<sup>5</sup> states that 70 to 75 per cent. of cases of tubercular middle ear disease in infants are due to infection spreading up the tube ; the bacilli are originally swallowed in the unsterilised milk, and in the process of regurgitation infected milk clots are deposited in the tonsillar crypts and in the naso-pharynx. Milligan has found on microscopic examination tubercular adenoid tissue around the Eustachian tube from the naso-pharyngeal to the tympanic orifice.

*Instruments.*—Yankauer uses the following instruments among others :



—(1) Eustachian applicator; this is made of a double strand of thin wire with a small loop at the end so that it can be easily and safely coated with a thin layer of cotton-wool. (2) Gum-elastic bougies of a brick-red colour, so as to be visible through the membrane when they enter the tympanic cavity. These bougies are graduated, so that when passed into the catheter up to the beginning of the first band the distal end of the bougie is flush with the end of the catheter; the two first bands are each 10 mm., and the third one is 5 mm. in width, and this distance (25 mm.) marks the usual situation of the isthmus; beyond this point the bougie is graduated by bands 2 mm. wide up to 37 mm., at which point the distal end enters the tympanic cavity. Measurements vary very slightly in different patients. (3) Eustachian sounds similar to the bougies but without the olivary ends. (4) and (5) Curved probes and curettes for reaching the isthmus of the tube through the external auditory meatus by means of an artificial or pathological perforation of the tympanic membrane. The curve of these instruments is that of the arc of a circle 5 cm. in diameter.

*Acute Eustachian salpingitis* may be either catarrhal or suppurative. According to Koyle<sup>6</sup> the catarrhal form occurs frequently during attacks of "head-cold"; the ear feels stopped up and the patient inserts his finger into the external meatus to "open" the ear, or swallows or yawns to effect the same purpose. Slight deafness and tinnitus and even vertigo may come on in a few hours, while the patient complains of the reverberation of his own voice in his ear: there may be a sensation of pain in the pharynx. All these symptoms are the result of Eustachian obstruction and the consequent absorption into the blood of the oxygen in the air contained in the middle ear cleft; the tympanic membrane is pushed inwards by the greater air-pressure in the external meatus, and the mucous membrane of the tympanic cavity can be seen through the membrane to be in a state of hyperæmia (*ex vacuo*). On posterior rhinoscopy the Eustachian orifice may appear swollen and congested, and may contain mucous secretion. In the treatment of these cases Koyle recommends a nose-wash, followed by the inhalation of benzoin or menthol vapour, and the application of suction to the Eustachian tube by means of the Eustachian catheter and Politzer bag. The middle ear cleft is then gently inflated and argyrol (20 to 50 per cent.) is applied to the mouth of the tube. The patient himself may apply massage—stroking movement—from the mastoid process downwards and forwards to the angle of the jaw. Small blisters in front of the tragus have also been recommended. It is most important to persevere with treatment until the condition of the middle ear cleft is again normal, as adhesive processes in later life probably have their foundation laid during the period of childhood (Pattee<sup>7</sup>). In more severe cases of acute salpingitis and otitis media Yankauer recommends the passage of his applicator into the tube up

to the isthmus. The cotton-wool is charged with 5 per cent. cocaine and the instrument is allowed to remain in position till the solution has had time to take effect. This is followed by the application of 25 per cent. argyrol to the isthmus, and Yankauer claims that earache and tinnitus at once disappear, and, in mild cases, recovery follows almost immediately. If, however, the tympanic membrane be already red and bulging, it is better to perform paracentesis at once. In the terminal stages of acute purulent otitis media, after discharge has ceased and the perforation has closed, but when deafness and tinnitus still remain, the argyrol treatment again gives good results.

*Chronic Eustachian Catarrh.*—In this condition the mucous membrane of the tube is swollen and oedematous, and at the isthmus the slightest amount of swelling causes obstruction. If inflation be gently carried out the air does not enter the tympanic cavity at all and no improvement in hearing follows; if, on the other hand, great force is used, the air enters and bulges out the membrane, but, as the excess of air cannot escape, little or no good is done; in short, inflation is almost useless unless the tube is patent. In these cases Yankauer recommends the application of 5 per cent. cocaine, as described above, followed by the use of the Eustachian sound, which is left in position for ten minutes. This, again, is followed by the application of 50 per cent. argyrol. After the patency of the tube has been established, Yankauer recommends the use of a compressed air apparatus, fitted with a regulator and gauge, which allow the surgeon to turn on the pressure gradually; this apparatus is of course connected to the Eustachian catheter. Yankauer has never seen suppurative otitis media follow this treatment. Hopkins<sup>8</sup> advocates electrolysis as less painful than the ordinary method of dilatation; a gold bougie (No. 1) is used, and is attached to the negative pole; the current should never exceed 40 volts and 5 milliamperes. When the stricture is reached the current, which commenced at 1 milliampere, is increased up to 4 or 5 milliamperes, till the obstruction is overcome; when the bougie enters the tympanic cavity the patient's face assumes the "tympanic expression" (Kenefick). After an interval of two to four weeks the same bougie is again passed, and is followed later by larger sizes. Phillips,<sup>9</sup> on the other hand, maintains that the results of this treatment are no better than with the ordinary bougie, and that there was considerable danger of the end of the bougie being left in the tube. Electrolysis should only be used when the ordinary bougie has been tried, and failed. Ferran<sup>10</sup> has recommended the use of superheated air in these cases; the heat is obtained from an electric lamp enclosed in a small chamber and the warm air is driven through the catheter into the middle ear cleft.

*Chronic Suppurative Otitis Media.*—E. Urbantschitsch<sup>11</sup> points out that those cases in which the aural discharge is muco-purulent and the perforation is situated in the anterior part of the tympanic membrane

are really cases of chronic purulent inflammation of the Eustachian tube, and that they should be called "*Salpingitis purulenta chronica*." The tube in these cases is permeable, and the lotion used in syringing the ear frequently passes down into the patient's nose. Such cases should be treated by washing out the Eustachian tube through the catheter; the fluid returns by the external auditory meatus. In addition, it is advisable to massage the mucous membrane by means of a bougie medicated with 10 per cent. silver nitrate solution. Two to four sittings are usually sufficient to cure a case of "*tuborrhœa*." Yankauer, on the other hand, advocates in such cases the obliteration of the tube at the isthmus. He points out that one of the functions of the membrane is to protect the tympanic cavity from infection, and further, that when the membrane is perforated, this function is not properly performed. (As an analogy he points to the difficulty of filling a bottle with smoke unless there is a hole in the bottom.) Obliteration of the tube is performed as follows:—The external meatus and tympanic cavity are first cleansed by syringing and then dried; the inner tympanic wall and bony part of the Eustachian tube are next anaesthetised with 10 per cent. cocaine with a few drops of adrenalin; in certain cases the existing perforation in the membrane has next to be enlarged; a short aural speculum is now inserted and the Eustachian curette is passed into the tube under the guidance of the eye. The curettage itself can of course be performed by "feel" alone. Finally the operation area is powdered with boric acid and packed with gauze. Yankauer has operated in this way on twenty-one chronic cases with thirteen successes. Pain and hæmorrhage were slight at the time, but the mucous membrane of the inner tympanic wall showed considerable swelling for two weeks after operation—due, the author thinks, to lymphatic obstruction and consequent œdema. It is interesting to note that after closure of the tube the perforation in the membrane became larger, while the mucous membrane of the inner wall became pale and dry in about one month. The hearing power was not influenced in either direction in the majority of cases. In one instance Yankauer was able to obtain support of recent views as to the pathway of sound conduction, viz. that sound waves pass from the tympanic membrane to the air in the tympanic cavity, and thence to the membrane of the round (cochlear) window, and thus reach the perilymph in the scala tympani. According to this theory the ossicular chain and tympanic muscles are concerned merely in the regulation of pressure inside the labyrinth.

Oppenheimer<sup>12</sup> calls attention to the necessity for curetting the Eustachian tube at the end of the radical mastoid operation. He uses small oval curettes, and avoids pressure on the floor of the tube, which might injure the carotid canal. In this connection there can be no doubt that the weak point in the modified radical

mastoid operation, originally devised by Küster, and recently popularised by Heath, is the failure to eliminate the Eustachian tube as a source of constant or recurring infection.

REFERENCES. <sup>1</sup> Report by C. M. O. to Board of Education, 1908. <sup>2</sup> Yankauer, *Laryngoscope*, July 1910. <sup>3</sup> Politzer, "Diseases of the Ear," *Trans.*, 1909. <sup>4</sup> Kerrison, *Laryngoscope*, vol. xvii. p. 661. <sup>5</sup> Milligan, *Journ. of Laryngol.*, October 1910. <sup>6</sup> Koyle, *Laryngoscope*, vol. xv. p. 773. <sup>7</sup> Pattee, *Ibid.*, August 1910. <sup>8</sup> Hopkins, *Archives of Otology*, vol. xxxiv. p. 495. <sup>9</sup> Phillips, *Ibid.*, p. 511. <sup>10</sup> Ferran, *Journ. of Laryngol.*, August 1909. <sup>11</sup> Urbantschitsch, *Monats. f. Ohren.*, Bd. xliii. 1909. <sup>12</sup> Oppenheimer, *Med. Record*, 1909.

## NEW BOOKS AND NEW EDITIONS.

*Phases of Evolution and Heredity.* By DAVID BERRY HART, M.D., F.R.C.P.E. Lecturer on Midwifery and Diseases of Women, School of Medicine of the Royal Colleges, Edinburgh, &c. Pp. 260, with 10 figures. London: Rebman, Ltd. 1910. Price 5s. net.

THIS work contains a number of short articles on subjects more or less closely related to heredity, and may be regarded as an overflow from Dr. Berry Hart's more extensive investigations upon Mendelism and allied considerations. They deal with Darwin and Weismann, with Mendelism, with Mendel, with biometry and mnemism, mutation, heredity, heredity in disease, the community of bees, bee culture, with evolution and controversy, the handicap of sex, evolution in religious belief, and with men who have revealed themselves. One of the most interesting chapters is that which discusses the origin of men of genius—those at any rate who have, as Dr. Hart says, revealed themselves. Rousseau, Shakespeare (who, however, has *not* revealed himself according to the author), Amiel, and Pepys are specially dealt with, and the conclusion is reached, after some excellent bits of characterisation, that Pepys was one of the old Roman consuls and Amiel one of the Buddhists, just as Taine regarded Napoleon as one of the Medici come to life again. "Heredity," says Dr. Hart, "has its laws of which we know little yet; but the one we know least of is that regulating the appearance of men of genius or of such belated dwellers on this planet as Pepys and Amiel, the literary atavists of evolution."

The whole book is interesting, and the author is to be congratulated on having written many pages which are almost brilliant in their suggestiveness, and which are at the same time full of deep thought. Throughout it all there is an almost Pepysian *naïveté*, and it is not long before one sees that Mendel is enthroned in Dr. Hart's thoughts, and that he thinks none of us can be better employed than in "talking and thinking" Mendel, as Boswell hoped to make everyone think and



talk Johnson. All through the chapters the gametes and zygotes of Mendelism move in a sort of Brownian dance, or as the bees dart out and in "of a window in a town garden, perched on the cliff bounding the magnificent valley spanned by the Dean Bridge."

The chapter on the Handicap of Sex and that on Evolution and Controversy are well worth perusal, and the more scientific ones on Mnemism and Biometry are far easier to comprehend by reason of the author's clearness of expression and fertility in illustration.

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*Atlas of Pathological Anatomy*, reproduced from recent specimens; with explanatory text. By (the late) Professor Dr. ALFRED KAST, Professor Dr. EUGEN FRAENKEL, and Dr. THEODOR RUMPEL (from the State Hospitals, Hamburg). With a Preface to the English Edition by J. LORRAIN SMITH, M.D., Professor of Pathology, University of Manchester. In 26 Parts. London: Baillière, Tindall & Cox. Single Parts 5s. net; Single Plates 1s. 6d.

THIS is a highly important publication, not only from the point of view of the morbid anatomist, but also from that of the student and the medical practitioner who wish to familiarise themselves with the appearances presented by diseased organs and tissues. The illustrations are for the most part above criticism—though one or two of the later plates have suffered slightly in the process of reproduction—and they can be recommended as affording a safe guide to the study of morbid anatomy. It compares favourably with the well-known atlases of the Sydenham Society, of Cruveilhier, and of Lebert.

While the great expense entailed has prevented the illustration of the whole of morbid anatomy, this atlas is valuable, not only as affording presentments of a multiplicity of comparatively common diseased conditions, but still more because it illustrates diseases which are less infrequently encountered in the post-mortem room. For example, the anatomical changes produced by cholera asiatica are fully demonstrated, and the gangrenous pharyngites of angina Ludovici and scarlatina maligna are illustrated. The various ulcerations of the larynx and the changes produced by acute yellow atrophy in the liver are included, as well as such rare conditions as argyria of the kidney, malakoplakia of the urinary bladder, tuberculosis of the endometrium, and many others.

We note that the second representation of acute yellow atrophy corresponds to that form recently described by British authors as the subacute stage of the disease.

The text has been translated from the German in a highly satisfactory manner by Dr. F. C. Purser of Dublin. The salient clinical

and anatomical details are given in all cases. In one or two instances the description does not altogether tally with the designation of the corresponding illustration. For example, Fig. 20, Plate XII., is named upon the plate "carcinoma scirrhusum," while in the text it is described as an example of "medullary cancer." This, however, is merely a slip. The only illustration to which we would take serious exception is the second example of "chronic parenchymatous nephritis," which does not correspond to any specimen of that condition we have seen, and really represents a glomerular nephritis. On turning to the text for an explanation of this evident incongruity we find the statement that in the kidney illustrated the parenchymatous changes were "comparatively insignificant."

The translator has furnished an index of the illustrations, which is very essential, and refers each figure to the plate on which it occurs. This index, moreover, appears to be in some respects more accurate than the German equivalent. The illustrations, which number from one to six on each plate, have been drawn in colour from nature by W. Gummelt. The first fifteen parts have been reproduced by chromolithography, and the remainder by photographic processes. On the whole, the results attained by the former process are, as might be expected, better, but the later portions of the atlas amply demonstrate the high degree of excellence to which the "three-colour process" has been brought. Occasional faults in registration have crept in, notably in the representations of croupous pneumonia, varices of the rectum and pyelophlebitis, while in other illustrations the blue seems a trifle strong.

Viewing the work as a whole, quite apart from these slight blemishes, we would again express our admiration of it, and congratulate the authors on the highly successful completion of their fourteen years' labours.

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*Éléments d'anatomie pathologique.* Par le Docteur L. BÉRIEL, chef des travaux d'anatomie pathologique à la Faculté de Lyon, médecin des hôpitaux. Pp. 564, octavo, with 232 Illustrations drawn by the Author. Paris: G. Steinheil. Price 10 fr.

AS stated by the author, this volume is absolutely and uniquely practical, and from it is excluded everything theoretical, everything historical, everything controversial. Convinced of the importance of pathological histology in furnishing clues to the study of lesions, M. Bériel directs special attention to that branch of the subject, and thus leads up to the study of the naked-eye appearances. The data of general pathological anatomy constitute a preface, and in the subsequent chapters he considers their principal applications in elucidation of the

nature of the more frequently occurring lesions of the organs and tissues.

The teaching so far as it goes follows recognised lines, but we are of opinion that, with advantage, more details might have been supplied in the description of the pathology of the organs and tissues, seeing that the amount of space devoted to the consideration of tumours—more than one-third of the volume—gives a sense of want of balance and of disproportion.

While this is so, the consideration of tumours leaves little to be desired, particularly as the author concludes this part of his work with a chapter in which he discusses the histological diagnosis of tumours and the data upon which rests the diagnosis of malignancy.

The author's illustrations clearly demonstrate the points he wishes to make, and constitute what is by no means the least valuable feature of the work.

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*A Text-Book of Pathology for Practitioners and Students.* By JOSEPH M'FARLAND, M.D. Second Edition. Thoroughly revised, with 437 Illustrations. Pp. 856. Philadelphia and London: W. B. Saunders Co. 1910.

AFTER the lapse of six years a second edition of this now well-known work has been produced. The book has been thoroughly revised and brought up to date, and in plan and arrangement follows most of the more modern text-books on pathology. There are, however, one or two respects in which it is peculiar. For example, the bacteria are discussed under the heading of the lesions which they most characteristically produce. Thus the tubercle bacillus, along with bacillus mallei and the organism of syphilis, appears under the heading of the specific granulomata. We rather object to the perpetuation of the term granulomata, and we wonder why the lesions produced by these germs could not be described under the heading of the causal organisms. Also the pneumococcus is described under lobar pneumonia and the typhoid bacillus under diseases of the intestines. There is nothing to be said against this method, but we think it more in accordance with logical sequence to treat of the various lesions produced by a germ along with the description of the germ itself. After all, lobar pneumonia is very far from being the only lesion caused by the pneumococcus.

There are one or two statements in the work which would undoubtedly provoke adverse criticism from many pathologists. One such is made in connection with "fatty metamorphosis," or, as it is more usually called, fatty degeneration. The statement runs as follows:—"It differs from fatty infiltration in that the fat is not usually formed by synthesis out of materials brought to the cells

and stored within it, but is formed by conversion of the cellular proteids, the cell being partially or completely destroyed." We were under the impression that there was no such hard-and-fast line between fatty degeneration and infiltration—that, for example, there is distinct evidence to show that in phosphorus poisoning the fat in the liver cells is, to a considerable extent, derived from elsewhere—and that the derivation of fat from protein material was distinctly problematic.

On the whole, however, the book is a thoroughly sound one, and is to be cordially recommended to the student and practitioner as a clearly-written and reliable work. It contains all that he is likely to need, and in many respects it goes beyond the requirements of the ordinary professional examination. We venture to think that space might have been saved, and yet the book retain unimpaired its value, by omitting chapters devoted to certain special branches of the subject, *e.g.* that on diseases of the skin. Anyone desiring information in such questions would undoubtedly turn to special treatises; and students are not usually asked questions on such matters.

The work is copiously illustrated, a number of new drawings and photo-micrographs having been added in the present edition.

We congratulate the author on carrying a stage further a most laborious piece of work, and one which is well worthy of the traditions of his school.

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*Archives of the Middlesex Hospital.* Vol. XIX. Ninth Report from the Cancer Laboratories. Edited for the Cancer Investigation Committee by W. S. LAZARUS BARLOW, M.D., F.R.C.P. Pp. 243. London: Macmillan & Co., Ltd. July 1910.

THIS volume contains twenty-seven articles on subjects bearing directly or indirectly on malignant growths, written by members of the staff of the Middlesex Cancer Laboratories. Almost every form of inquiry into the nature of malignant growth and into treatment is represented. There are articles on the pathological chemistry of the blood in cancer, on the presence or absence of Altmann's granules in the cells, and on autolysis in cancer cases. Certain vaunted methods of non-operative treatment have been tried in the cancer wards of the Hospital, and although the results have been discouraging it is at least of value to know what these are. In cancer cases, soamin and atoxyl, and vaccination with micrococcus neoformans have not appreciably affected the course of the disease. Coley's fluid was tried in one case of carcinoma of the antrum of Highmore and in three cases of sarcoma. In one of the latter the primary growth diminished remarkably in size, but the patient's general health suffered greatly and death ensued without delay. In none of the other cases was any improvement, local or



general, observed. Locally, applications of powdered pitch-blende ore were found to be beneficial in cancerous ulcers of the mamma; the ulcers dried up and healed, and this was a relief to the patient, but the nodules and masses lying beneath the surface were unaffected.

Dr. H. MacOrmac contributes a valuable paper upon the "Relation of Rodent Ulcer to Squamous-cell Carcinoma," in which he draws attention to types of growth intermediate in character to well-marked examples of either form. He considers that all malignant epithelial growths of the skin proper (as distinguished from mucous membranes) must be grouped together, varying according to their rate of growth. He shows that not only typical rodent ulcers but also squamous-celled cancers of the skin proper have much less tendency to give rise to metastatic deposits than is generally supposed. That secondary gland infection is not prone to occur from scar epitheliomata is generally recognised. It would be important if on further investigation the same can be said of other forms of cutaneous epithelioma.

There are valuable statistical papers upon primary malignant disease of the small intestine and colon, of the rectum, and of the peritoneum, careful studies of tumours of the breast and perineum in dogs, and records of experiments made upon the growth and development of ova of an ascaris worm, and of the ova and caterpillars of the silkworm when subjected to various agencies which have been advocated in the treatment of cancer.

This volume shows that the workers in the Middlesex Cancer Laboratories are continuing to make valuable contributions to the great cancer question.

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*La Cure Radicale de la Hernie Inguinale.* By Dr. LUCAS-CHAMPIONNIERE, Hon. Surgeon to the Hôtel Dieu, Member of the Académie de Médecine. Pp. 192. With 53 Illustrations. Paris: G. Steinheil. 1909. Price, 3 frs. 50.

THIS small volume, the illustrations of which clearly indicate the author's technique, gives in a condensed form much of the work he has already published both in his larger work on hernia and in numerous short papers. On this occasion, however, he confines himself to inguinal hernia. Championnière was one of the pioneers of the operative treatment of hernia, which, like many innovations, was strenuously opposed by some of his colleagues.

In the earlier part of the work statistics of the many operations he has performed are given; he has never had a death in patients between the ages of five and twenty-five years of age, at which period of life the operation can most satisfactorily be performed.

Most surgeons consider two steps essential in the operative treatment of hernia—the treatment of the sac, and the treatment of the

abdominal wall. Championnière adds a third, namely, free removal of as much omentum as possible in every case. Many surgeons look upon the omentum as a protecting agent, and in hernia it often fills a sac which might otherwise become a dangerous resting-place for a loop of intestine; Championnière, however, looks upon the omentum, as far as hernia is concerned, as an enemy, and recommends its free removal, whether in the sac or in the vicinity of the hernial opening.

With regard to the sac, he considers the complete obliteration of the neck essential, a point on which all operators are agreed, although their methods to achieve this may not all be similar. He also lays stress on the necessity of attacking the sac at the internal ring rather than in the canal, as at the former site it can be more easily separated from the cord. The main point of his treatment of the abdominal wall consists in complete overlapping of the oblique muscles after an incision which freely exposes both the canal and the internal ring.

Not only does Championnière accentuate the importance of his own technique, but he also impresses on the reader the use of the special instruments he employs for this operation, which instruments are well illustrated in the chapter devoted to them, as well as in the illustrations showing the steps of the operation.

His after-treatment consists in at least three weeks' rest, with abdominal exercises and subsequent avoidance of excessive strain for six months. He considers walking the ideal exercise during that time, but also advocates cycling.

One chapter is devoted to difficulties and complications sometimes met with, and of operators who deny their existence, or have not met with them, he says that their operations are not sufficiently extensive and that they content themselves "*de moucher la hernie*."

All who are interested, not only in the theory of hernia, but in the operative technique, should read this volume, written, as it is, by one whose experience in the treatment of hernia is equalled by few.

*Précis du Traitement des Fractures par le Massage et la Mobilisation.* By Dr. LUCAS CHAMPIONNIERE. Pp. 268. Paris: G. Steinheil. 1910. Price 3½ francs.

THIS is a most suggestive and illuminating book, upsetting many pre-conceived ideas, and infusing a new interest into the treatment of fractures. A clinical experience of his method, extending over thirty years, enables the author to bring accumulated proofs of its efficacy and general applicability. The radiograph is claimed as a powerful witness to the truth of many of his assertions.

To the patient his method lessens pain and discomfort, shortens convalescence, and ensures better functional results; to the surgeon

it means simpler apparatus, much personal supervision and care, but unqualified success. He admits few limitations and knows no failure.

It is a handbook of treatment only. Beginning with a short account of the development of his method, the author passes on to a general statement of its principles and modes of application. The latter half of the book considers the common fractures individually, and details in each case his method of treatment. This part is full of practical hints and warnings.

Thus the book forms a complete guide to a method of treating fractures which is claimed to be of almost universal application. The careful consideration of all in surgical practice should be directed to it.

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*Sprains and Allied Injuries of Joints.* By R. H. ANGLIN WHITE-LOCKE, M.D., F.R.C.S., Oxford. Second Edition. Pp. 280. London: Henry Frowde and Hodder & Stoughton. 1910. Price 7s. 6d. net.

IT is less than a year since we had the pleasure of bringing the first edition of this work to the notice of our readers, and we congratulate the author that a second edition has so soon been called for.

The general plan and scope of the work has not been altered, but in many ways the text has been amplified and improved. The illustrations are more numerous, and a number of new case records have been interpolated.

We can confidently recommend this volume of the "Oxford Practitioner Series" as a safe practical guide to the diagnosis and treatment of a class of injuries which often put a severe tax upon the skill and ingenuity of the practitioner.

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*Dislocations and Joint Fractures.* By FREDERIC JAY COTTON, M.D., Associate Professor of Clinical Surgery, Tuft's Medical School, Boston. Pp. 654. 1201 Original Illustrations. Philadelphia and London: W. B. Saunders Co. 1910. Price 25s.

YET another volume has been added to the long list of recently published books coming to us from America, and although the terminology and style are not quite what we are accustomed to in this country, it must be said, in justice to the author, that the work has been very carefully compiled, and that many references are included from the current literature.

The writer considers that hitherto we have placed too much reliance on the descriptions and followed too closely the ideas of the famous surgeons of the last century, and that, in view of the knowledge

obtained in recent years from radiography and from the operative treatment of injuries around joints, it is necessary to describe afresh the injuries of these regions.

His views on early massage in fractures and dislocations are interesting, and although he advocates earlier movement than was formerly employed, he deprecates strongly the "frenzied lead," as he describes it, of some of the French surgeons.

The advice offered in regard to the primary and secondary operative treatment of joint injuries is restricted to eighteen axioms, and it is to be regretted that the detailed technique of the individual operations has been omitted.

The author has given us a very comprehensive description of joint injuries, but the work suffers from a prolixity in classification and a distinct lack of anatomical detail which no quantity of indifferent radiograms, thumbnail sketches, or diagrams will replace, while the inclusion of so many illustrations has caused the volume to assume unnecessary dimensions.

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*Urgent Surgery.* By FELIX LEJARS, Professor Agrégé à la Faculté de Médecine de Paris, Chirurgien de l'Hôpital Saint-Antoine; Membre de la Société de Chirurgie. Translated from the Sixth French Edition by WILLIAM S. DICKIE, F.R.C.S., Surgeon, North Riding Infirmary, Middlesborough, etc. Vol. II. Bristol: John Wright & Sons, Ltd.

WE have already expressed our satisfaction with the first volume of this work.

The second volume contains four sections; the first two are concerned with the urgent surgery of the genito-urinary organs, and of the rectum and anus. They are in every respect excellent and up to date. A third section, extending to over one hundred pages, is devoted to the consideration of strangulated hernia, and is one of the best in the book. The author's thesis that "the surgeon must be prepared for anything and astonished at nothing during the course of an operation for strangulated hernia" is an indication of the thoroughness with which the common as well as the rarer varieties of hernia are considered.

The urgent surgery of the extremities is dealt with in the concluding section of a work in which the best traditions of French surgery are upheld, and which has lost nothing by its translation into the English language.

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*Surgical After-Treatment.* By L. R. G. CRANDON, A.M., M.D., Assistant in Surgery at the Harvard Medical School. Octavo of 803 pp. with 265 Original Illustrations. Philadelphia and London: W. B. Saunders Co. 1910. Cloth, 25s. net.

"THESE suggestions for after-treatment of surgical cases are written for two classes of practitioners—house surgeons in hospitals, and general practitioners in communities which are not surgical centres" (Preface). The author has spared no pains in fulfilling the object he had in view, and has produced a very exhaustive and satisfying book. There are fifty-three chapters in all, with an appendix on Sickroom Cookery. The first part of the book deals with general methods of treatment, and includes thirty-nine of the chapters. In these there are discussed, among other subjects, all that concerns the after-effects of anæsthesia, shock, coma, psychical disturbances, thirst, pain, want of sleep, hæmorrhage, the treatment of wounds aseptic and septic, bedsores and sinuses and fistulæ. Artificial limbs are considered at some length, as well as the principles and practice of massage and electric and X-ray therapy. As an indication of the author's method we may select the subject of hæmorrhage, the forms of which are grouped under the heads of primary, delayed, and secondary. Primary hæmorrhage does not properly belong to after-treatment, and the after-effects of it are considered along with those from other forms of hæmorrhage. The term "delayed hæmorrhage" is used to indicate bleeding coming on any time within six days of the operation, and its causes are grouped under seven heads. Special attention is rightly drawn to concealed hæmorrhage, where the bleeding takes place within the body, as, for instance, into the peritoneal cavity. The symptoms are described and the means of treatment pointed out. Secondary hæmorrhage and its appropriate treatment by local and general measures are in like manner adequately discussed.

But after bleeding has been stopped the patient requires treatment for loss of blood, and the author enters fully into the recent development of blood transfusion. Long extracts are quoted from Crile's writings, and the special instruments required are figured. Three different cannulæ for direct transfusion are described, and preference is given to Elsberg's over Crile's or Bernheim's. The technique required with Elsberg's is relatively simple. Its inventor claims that he can complete the anastomosis between the donor's artery and the recipient's vein within four minutes after the artery has been isolated.

In Part II. the various operations in modern surgery are considered individually, and the various points of importance in the after-treatment are mentioned. Chapter LII. contains a full account of therapeutic immunisation and vaccine therapy by Dr. George P. Samborn, a disciple of Sir Almroth E. Wright. In Chapter LIII.

we have an impartial review of the results of treatment by Coley's fluid.

The author expresses his meaning clearly and concisely, and builds up his conclusions logically upon the basis of accurate knowledge and extensive experience.

The book embodies the practice of many of the leading American surgeons. It will on that account be all the more welcomed, not only by those for whom it was primarily intended, but also by British surgeons who wish to compare their own methods with those in use in America.

*Conversations with Women Regarding their Health and that of their Children.*

By A. RABAGLIATI, M.A., M.D., F.R.C.S.(Edin.), Honorary Gynecologist, late Honorary Surgeon, Bradford Royal Infirmary, etc. Three Illustrations. Pp. 318. Bradford: Wm. Byles & Sons, Ltd., Printers. 1910. Price 5s. net.

THIS work is a restatement of Dr. Rabagliati's views on air, food, and exercise, and an application of them to the diseases peculiar to women and children. It is a difficult book to review, for if the author is right in his opinions, nearly everyone else is wrong. We are told that the book is written from the idealistic point of view, on the assumption that energy is the immediate cause of material substance "as distinguished from the view commonly, or even universally (?) adopted by science that the material substance is the immediate cause of energy." We do not begin our life as bodies with so much energy put into them, but as quantities of energy (zoo-dynamic) supplied with bodies to be houses or habitations for the manifestation of the powers of that zoo-dynamic (anthropino-zoo-dynamic in the case of the human subject, feline-zoo-dynamic, in the case of the cat, etc.). Of course this view lessens the importance of the purely material additions that we make (*e.g.* by the food we take) to our lives in order to sustain them; we are not so dependent upon the taking of nourishment frequently, and in such large quantities as we think and have been taught to think. From this the author passes to the disorders of nutrition and their treatment, and applies his views to the disorders of nutrition of the genital organs of women and the method of dealing with them which he recommends. Most of us eat too much; we overload the bodily machine, and prevent its energy (anthropino-zoo-dynamic) manifesting itself; "neither the energy of the body nor its heat comes from the food . . . food is not the cause of life, but the power to assimilate food is one of the powers of life." Dr. Rabagliati's main contention is that "our sufferings are brought on us, not by fate, not by environment, nor by our ancestors, but mainly by ourselves." In the management of labour and the puerperium, for instance, he thinks that antiseptic precautions (rubber gloves, operating

jackets, &c.) are of less importance than the diet; he quotes Dr. Abramowski's results, which seem to show that women who have a lighter and more restricted diet during pregnancy have easier times, and that women who had fearful times under the heavier diet, have much easier times under the lighter (fruit) diet. It is a pity that Dr. Rabagliati has thought it necessary to overburden his pages with so many unfamiliar terms (*e.g.* alectorido-zoo-dynamic, apameibo-dynamic, heuretico-zoo-dynamic, triphthæmic, monositeous, tetrasiteism) which even to a medical man are difficult of comprehension, and must be more difficult to the women who are addressed in his lectures. Of course it may be pleaded that a new message is being given to the world of suffering women, and that it demands a new nomenclature; but by keeping the terms in ordinary English and putting them in italics the result might have been achieved almost as well. It is very wonderful how the author ranges over the whole field of pathology. from corns and cancer to endometritis, heartburn, and spring illnesses, and attempts to show that they are all due to wrong food habits. The surgeon will probably not agree with him in his remarks about the colon and the appendix vermiformis, the obstetrician will no doubt see another explanation for diphtheritic patches on a stitched perineum after labour, and the physician may be dubious about his explanation of recurring attacks of influenza; but there can be no hesitation in saying that Dr. Rabagliati's *Conversations* are thoroughly interesting, and that his recommendations are in some cases at least worthy of a trial.

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*Practical Obstetrics.* By E. HASTINGS TWEEDY, F.R.C.P.I., Master of the Rotunda Hospital, and G. T. WRENCH, M.D., late Assistant Master. Second Edition. London: Oxford University Press. 1910. Price 12s. 6d. net.

In this edition the text has been thoroughly revised and several new illustrations added. The section on deformed pelves has been, to a large extent, rewritten, and the instructions as to the method of conducting the labour in such cases are very precise and clear. In the treatment of rupture of the uterus the authors advise delivery by the vagina, and simple packing of the rent with gauze, and drainage. Their last six cases so treated all recovered. In dealing with the toxæmias of pregnancy the modern conceptions of their causation are explained. In the Rotunda Hospital accouchement forcé is never practised in eclampsia, reliance being placed on morphia and saline infusion, together with free purgation. With this treatment the authors state that their maternal mortality has been only 9·09 per cent. The book is a valuable one for the practitioner, owing to the great detail with which instructions are given for the treatment of all obstetric complications.

*Manual of Diseases of Women.* By W. E. FOTHERGILL, M.A., B.Sc., M.D., Assistant Gynaecological Surgeon, Royal Infirmary, and the St. Mary's Hospitals, Manchester, etc. Pp. 433. With 144 Illustrations. Edinburgh and London: William Green & Sons. 1910. Price 5s.

AMONG the recent works on gynaecology which pour in such profusion from the press in these days, Dr. Fothergill's volume will surely occupy an honourable place. It is well written, well printed, well bound, and sufficiently illustrated. It contains no statements which are in conflict with the general consensus of opinion in this country as to what should be done and what left undone in gynaecological practice, and in general inclines rather to the conservative than to the radical views as to operation; and it is not overweighted by references to the works of other gynaecologists—in fact, with the exception of such names as have come to be associated with instruments, the reader may go forward page after page without meeting a single proper name. No doubt the last-named character has its advantages, and the general reader will care little whose views he is perusing so long as they are presented to him in an intelligible form. He will be grateful to the author for condensing or expanding or explaining them to him; but there is something to be said for the other plan of naming workers in this field of research in association with the advances which they have been able to make, and it adds very little to the space occupied and very greatly to the interest of the student if this be done. We must, however, take with gratitude what our author gives us, and thank him for arranging his material with such regularity and precision. We note with some surprise that he regards the "Hodge" as the most useful type of pessary for retroversion, as we ourselves have found the "Albert Smith" modification to be better, and it is certainly more exactly in accordance with the anatomy of the vagina. Perhaps Dr. Fothergill really means the "Albert Smith," for in describing the introduction of the support he speaks of the "broader end," and, of course, the "Hodge" is of the same width at both ends. Many of the illustrations are both useful and artistic, and the publishers deserve a word of praise for the way in which they are reproduced, and in general for the get-up of the book. The last part of the work, which is entitled, "The Management of Gynaecological Cases," and deals with preparation of patients, arrangements for operations, and after-treatment, is likely to be useful to young operators. It is noteworthy that Dr. Fothergill, who on p. xviii. thinks that "gynaecology" is best used as including both "midwifery" and "diseases peculiar to women," is driven to employ "gynaecological" as the adjective; indeed "gynaecology" is too firmly established to be replaced by "diseases of women."



*The Essentials of Histology.* Descriptive and Practical for the Use of Students. By E. A. SCHAFER, M.D., Sc.D., LL.D., F.R.S., Professor of Physiology in the University of Edinburgh. Eighth Edition. Pp. 571. London: Longmans, Green & Co. 1910. 10s. 6d. net.

WE welcome the appearance of an eighth edition of Schäfer's *Essentials of Histology*. It continues to grow in size and in comeliness. If the present rate of growth continues, the lot of the student of histology of the future is to be pitied—when the essentials of his science cannot be confined to 570 pages! In every section of this new edition the wide knowledge and the judicious and painstaking care which invariably characterise the author's work are manifest. It is, and we are sure will continue to be, the standard book on the subject.

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*St. Thomas's Hospital Reports.* New Series. Edited by Dr. H. G. TURNEY and Mr. W. H. BATTLE. Vol. XXXVII. Pp. 369. London: J. & A. Churchill. 1910. Price 8s. 6d.

THE present volume of *St. Thomas's Hospital Reports* is similar in its general lines to those of preceding years, and, in separate reports from the various departments, contains a complete abstract of the work of the hospital for the year 1908. But, for the first time, a general statistical table, which includes the medical, surgical, and gynecological cases, is given. This table is arranged under definite age periods, and under the diseases and injuries, according to the authorised nomenclature, and gives a valuable statistical survey, which will be available for comparative purposes. Appended to the table are more detailed descriptions of noteworthy cases. The book also includes the "Salter Research Report," by Dr. E. A. Ross, who gives an analysis and abstract of cases in the hospital treated by bacterial vaccines from February to December 1908. The volume also contains the index to vols. xxvi.-xxxvii.

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## NOTES ON BOOKS.

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*Laboratory Notes on Organic Chemistry for Medical Students*, by Paul Haas, D.Sc., Ph.D. (Macmillan & Co.), contains much that might be of use to medical students, particularly during the period of their study of physiological chemistry. It is, however, somewhat scrappy, as indeed its title would indicate, and leaves many things unmentioned that are equally important with those considered in detail. Following a general account of the methods of melting-point and boiling-point determination, distillation, and cryoscopy, comes a very short section

on organic preparations, which is succeeded by instructions for the quantitative estimation of nitrogen, fat, urea, uric acid, glucose, and cane-sugar. Tests for elements commonly occurring in organic substances, together with those for some important organic compounds, are then given, and the book concludes with an appendix of twenty pages, giving more tests and a brief account of the properties of colloids, the law of mass action, and the polarimeter.

The instructions for practical work are on the whole clear, though not of uniform excellence.

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*Aids to Microscopic Diagnosis (Bacterial and Parasitic Diseases)*, by Ernest Blake Knox, B.A., M.D. (Baillière, Tindall & Cox), is intended as an aid to those preparing for examination. It sums up in small space the knowledge usually required of students upon the more common pathogenic parasites. The order in which the subjects are taken is a little unusual. Commencing with malaria, trypanosomata, etc., the pathogenic bacteria are next described, and subsequently certain worms. The last chapter contains descriptions of staining methods, methods of making vaccines and carrying out opsonic estimations. The book is accurate as regards its subject-matter, and is well written. It is not intended to replace fuller works on bacteriology, but merely to form a summary.

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We are glad to welcome, in a short space of time from its first appearance, a second edition of *Physiological Principles in Treatment*, by W. Langdon Brown, M.A., M.D.(Cantab.), F.R.C.P. (Baillière, Tindall & Cox). The new volume contains a few additions and alterations in points of detail, but is substantially the same book. Little more need be said than to confirm the emphatic approval with which the first volume was received. The author aims at effecting a *rapprochement* between physiology and medicine, which have shown, he admits, some estrangement in past years, and in these pages he exhibits physiology in the humbler rôle of a handmaid to practical medicine. In a small compass he gives a compact and lucid account of recent advances in physiology and of their practical applications to therapeutics, and reveals to practitioners a keener and more discriminating use of remedies new and old.

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The present volume of the *Transactions of the College of Physicians of Philadelphia* records an important event in the life of the college, the oldest of the American medical corporations, namely, the opening and dedication to the use of the college of a new hall. Photographs of the new building and of the medal struck to commemorate the occasion are given, and the various congratulatory addresses delivered are reproduced. The ordinary contents deal as in former years with

medical subjects of great interest and variety. The volume also includes the Nathan Lewis Hatfield Prize Essay for 1909, awarded to Professor Martin Fischer of Chicago for a long and valuable paper on "Edema."

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Dr. Charles B. Slade's *Physical Examination and Diagnostic Anatomy* (W. B. Saunders Co.) is intended for the student commencing the study of clinical medicine, and deals with the principles and technique of the ordinary methods employed in the physical examination of the heart, lungs, and abdominal organs. The application of the various methods is concisely and, as a rule, clearly described, abnormalities commonly met with being discussed without entering into the question of the diagnosis of specific diseases. The surface markings of the various organs are also dealt with. The book should prove useful to the student if used in conjunction with practical demonstration of the methods of examination described in it.

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*Notes on Physiology*, by Henry Ashby, M.D., eighth edition (Longmans, Green & Co.), is an admirable little text-book. It contains a fairly full account of the tissues and of the structure of the organs, so that it is well adapted for those who wish to know something of physiology but have not the opportunity of practical study. The book was written originally for students preparing for the primary examination of the College of Surgeons. This statement in the preface, together with the attractive form of the book, may tempt the student to rely on it alone for his examination. We do not think it is full enough to satisfy the requirements of a medical pass examination, but it might be confidently recommended to nurses.

The term "proteid" might have been dropped in favour of the more modern "protein," and the idea that red corpuscles are derived from blood plates should now be decently buried. We note a misprint in the naming in Fig. 105.

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*Food and Hygiene*, by William Tibbles, LL.D., M.D. (Rebman, Ltd.), in its second edition has been brought up to date in a praiseworthy manner. This is particularly the case as regards certain forms of dietetic treatment. The conception of the work is admirable, and, at its price, we know of no work which surpasses it in practical utility.

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*Diseases of Children*, by Dr. Abraham Jacobi (D. Appleton & Co.), is a composite production by eighteen well-known pediatric physicians. The work and the opinions of all of these are well known in this country, and in the compilation which forms this book one finds much that is interesting and but little that is new. Each paper is entirely independent of the others, and while a vast extent of ground is covered, the book is by no means a work on diseases of children as a whole.

With the tenor of Dr. Ralph Vincent's work—*The Nutrition of the Infant*, third edition (Baillière, Tindall & Cox)—in so far as it is a plea for a purer milk supply and greater precision in infant feeding, we are wholly at one. As a practical work on the treatment of healthy or sick children the book is, however, not very convincing.

Lacking the ideal—clean milk—we are bound to face the fact, and we are also forced to realise that milk procured from a model dairy and scientifically handled in a hospital laboratory is not such milk as goes to nourish the babies of the poorer class at home.

Dr. Vincent's wholesale condemnation of the application of heat to milk is, we venture to think, utterly without justification, either on experimental or clinical grounds.

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Dr. William Easterly Ashton's *Text-Book on the Practice of Gynæcology*, fourth edition (W. B. Saunders Co.), is one of the largest text-books on gynæcology in the English language, and in the fourth edition has been brought thoroughly up to date. No detail is too trivial for mention, and the book is therefore a valuable one for reference, especially with regard to treatment. As a text-book for the student it is too large, and is burdened with a number of illustrations, some of which are only of slight value.

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The third of a series of appendices to *Squire's Pocket Companion*, now issued, brings up to date the recently published eighteenth edition of the larger *Squire's Companion*. It is a concise review of the progress of therapeutics and pharmacy from 1908 to 1910. It contains interesting articles on such important subjects as Atoxyl, Novocaine, Stovaine and Spinal Anæsthesia, Scopolamine-Morphine Anæsthesia, Chemical Standardisation as recorded in the Transaction of the Pharmaceutical Section of the Seventh International Congress of Applied Chemistry. The little volume is well worth the attention of medical men; it contains much valuable information presented in an attractive form.

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Sir William Whitla's *Elements of Pharmacy, Materia Medica, and Therapeutics* (Baillière, Tindall & Co.) has now reached a ninth edition, an excellent testimony to its value to the practitioner and student. The volume opens with a very good account of pharmacy, the methods of administration of medicines, prescription-writing, and groups of therapeutic agents. More than half the volume is devoted to therapeutics, the subject-matter being arranged alphabetically under the different remedial agents. A section is devoted to non-official remedies, most of which is new, and includes consideration of sera and vaccines. Detailed criticism of such a work is unnecessary; the appreciation of the profession is a good criterion of its usefulness.



# EDINBURGH MEDICAL JOURNAL.

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## EDITORIAL NOTES AND NEWS.

IN the development of surgery, anatomy and pathology have played a prominent part, and have themselves been enriched by the association. Physiology, too, since the days of Harvey has lent its aid to an extent which is scarcely realised. But while surgery has kept pace with anatomy and pathology, it has been outrun by physiology, and at the present rate of progress can never draw level. It stands to the credit of our American colleagues that they are the first to make a combined effort to reduce the leeway. No finer tribute to the value of experimental physiology, as applied to surgery, could be cited than the recent address of Dr. Harvey Cushing on the special field of neurological surgery,<sup>1</sup> the department which he so brilliantly adorns. "There is no question but that a training for neurological surgery must come through laboratory experiences, and just as we are indebted to experimentation on the lower animals for almost every fact of importance which has made for the advance of this particular department, so also must we call upon them for the mere practice of hand essential to success in their clinical applications." So wide is the field of physiology that nowadays one man can only hope to stake out a small corner for intensive cultivation, or in other words must specialise. But when he has prepared the ground and sown the seed the harvest is reaped by the general surgeon, and the specialist for the time being disappears. Cushing says: "So long as there are individuals capable, after a general training, of working along novel lines, and with the imagination for research which leads to contributions, so long will the field of their endeavours justify its being regarded as 'special.' . . . But when progress lags and by the time others with no broad conceptions have crowded in, what was once specialisation becomes properly absorbed again in general surgery, until, perchance, pathfinders crop up whose work brings on a new cycle." The plea is often urged by the young graduate, that he has not the opportunity either for experimental investigations or for the clinical application of his results. But although at present the inducements to turn to laboratory work in this country

<sup>1</sup> *Johns Hopkins Hospital Bulletin*, October, 1910.

fall short of those offered in America, it may with truth be said that such as we possess are not fully taken advantage of. The argument that no opportunity exists for the clinical application of results is founded on the mistaken idea that surgery and operative surgery are synonymous. Let the young graduate realise that diagnosis is as important a branch of surgery as operating, and he will no longer rail against the lack of opportunity for carrying his newly-acquired knowledge to the bedside.

How is physiology to be drawn closer to surgery? First the teacher must learn physiology, and impart it to the students at the bedside, then, having inspired even one out of a hundred, he must welcome him to the laboratory and the hospital. Without paying less attention to the anatomy and pathology of the dead, let us pay more to the physiology and pathology of the living, so that we may say that "the transformation of surgery from practices based almost wholly on an anatomical knowledge of the surface and extremities of the body to ones based on the physiological activities of the viscera has come."

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#### Medical Fees.

To the latest number of *International Cliniques* Professor James J. Walsh of New York contributes a most interesting article on "Physicians' Fees down the Ages." The first physician to whom Professor Walsh refers is I-Em-Hetep, who probably lived about 4500 B.C., who "seems to have had admirable success in the practice of his profession." Coming to more modern times we learn that about 2250 B.C. King Hammurabi of Babylon promulgated among other matters a code of medical fees, which was discovered in 1902 by a French expedition. It is a very interesting code, and it cut both ways.

"If a physician operate on a man for a severe wound (or make a severe wound upon a man) with a bronze lancet and save the man's life, or if he open an abscess (in the eye) of a man with a bronze lancet and save that man's eye, he shall receive ten shekels of silver (as his fee).

"If he be a freeman, he shall receive five shekels. If it be a man's slave, the owner of the slave shall give two shekels of silver to the physician."

Professor Walsh estimates that ten shekels of silver would be equal to about six hundred dollars (a hundred and twenty guineas) of our money. But now comes the cut the other way.

"If a physician operate on a man for a severe wound with a bronze lancet and cause the man's death, or open an abscess (in the eye) of a man with a bronze lancet and destroy the man's eye, *they shall cut off his fingers.*

"If a physician operate on a slave of a freeman for a severe wound with a bronze lancet and cause his death, he shall restore a slave of equal value.

"If he open an abscess (in his eye) with a bronze lancet, and destroy his eye, he shall pay silver to the extent of one-half of his price."

One's first idea is that it would take a bold man to be a surgeon in those days, but Professor Walsh thinks it is probable that such damages were not imposed on men with thoroughly established reputations, and that the law served only to prevent the practice of the unskilled.

A physician called Demokedes received from King Darius a pair of gold bracelets for reducing a dislocation. He appeared dissatisfied with this "decoration," and so the king gave him a furnished house and the right to sit at table with the king.

In the time of Hippocrates the Grecian cities made arrangements for the medical care of the poor, and—we commend this to the notice of Mr. Lloyd George—the salary of a regular dispensary physician was from £300 to £500 a year. Coming down to quite modern times we have printed in full a code of fees agreed on by the practitioners of physic and surgery in New York in 1798, which contains a number of interesting items. Verbal advice was 5 dollars, but a "letter of advice" cost twice as much; bleeding in the arm was a dollar, bleeding jugular vein 2, and opening an artery 5; amputation of the breast, arm, or leg cost 50 dollars; amputation of the penis 20; extirpation of the testicle 50. Reduction of a hernia was 25 dollars; the operation for the same 125. Midwifery fees were from 15 to 25 dollars "for a common case," and for "tedious or difficult cases" from 25 to 40; and dealing with these Professor Walsh points out that, measured in purchasing price, money was worth at least three times as much as now.

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**Vital Statistics for  
London, 1909.**

In the annual reports of the Medical Officer of Health for the London County Council we have a very complete statistical examination of the health of the largest community in the world, and see the operation of State medicine on its greatest scale. The broad feature of the report for 1909 is a declining rate in births, marriages, and deaths, happily most marked in the last. The death-rate of London for that year was 14 per 1000 living at all ages. Of great cities abroad, only Amsterdam and Brussels showed a lower figure, while in England and Wales only Bristol and Leicester improved on the record of the metropolis. A comparison of the infantile mortality rate gives almost identical results, London giving place only to Amsterdam and Stockholm abroad, and in England to Bristol alone. These figures are a flattering commentary on the work of Sir Shirley Murphy and of the medical officers of the twenty-nine sanitary areas into which the administrative county of London is divided. Further analysis shows that the shrinkage in the death-rate is distributed over nearly the whole calendar of scheduled diseases, an increase being shown only in measles, influenza, pneumonia, and cancer. In influenza by far the largest number of deaths took

place during March and April, while in pneumonia the total for the year exceeded anything recorded since 1890. For cancer, the death-rate has shown a steady increase since 1851. An Act of 1907 gave the London County Council power to examine samples of milk, consumed within its area, for tubercle bacilli.

During 1909 there were taken about 1900 churn samples, brought from no less than twenty-eight English counties, and of these 10·4 per cent. were shown to contain tubercle bacilli "on bacteriological examination." It may be presumed that "bacteriological examination" means a film examination of the milk sediment, and does not include the more searching test of animal inoculation. The difference is a very important and critical one, for without such a complete examination the real extent of tuberculous contamination of milk can never be established. The partial examination is no doubt sufficient to detect cases of massive contamination by tuberculous udders, but we are assured, on the authority of the Royal Commission on Tuberculosis (Second Interim Report), that milk may contain tubercle bacilli when the udder shows no sign of tuberculosis, and such cases of minimal contamination will almost certainly be missed by the examination of a film. A guinea-pig is highly susceptible to these minimal doses of virus, and it has never been shown that a young child is not. In any case, it is very regrettable that, when powers have been obtained to determine the extent of tuberculous infection in milk, public health authorities, headed by the London County Council, have adopted inadequate standards, and thus present us with masses of figures which leave this fundamental question unanswered.

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Sir David M'Vail. A LARGE and representative company assembled on 20th January to do honour to Sir David M'Vail and to congratulate him on the honour of knighthood recently bestowed on him.

The chair was occupied by Dr. D. N. Knox, President of the Royal Faculty of Physicians and Surgeons, and the company was representative of the many-sidedness of the guest's interests. Churchmen, lawyers, business men, and doctors all came to do honour to one with whom most of them had probably at one time or another crossed swords; not many knights won their spurs in so many battles as Sir David.

His health was felicitously proposed by his old friend and fellow-student, the chairman, and Sir David, in replying, gave an interesting account of his student days in the old Royal Infirmary under Lister and Gairdner.

Later in the evening Dr. John Patrick, on behalf of Sir David's old residents, presented him with a gift of plate, and dealt very happily with the lighter side of his old chief's character. Not many of us had suspected Sir David of a weakness for Mrs. Hemans' poetry.



# CONGENITAL FAMILY CHOLÆMIA.

By ASHLEY W. MACKINTOSH, M.D., A. W. FALCONER, M.D., M.R.C.P.,  
and A. G. ANDERSON, M.B.

THE following case was admitted into the Aberdeen Royal Infirmary under Dr. Mackintosh on 31st October 1910.

H. T., male, aged 7.

*Family History.*—The father was alive, aged 37, and was quite healthy. The mother was alive, aged 36. Until she was 20 her colour was not good, but she was quite definite that she was not jaundiced. Since then she had been quite strong. There had been three children and no miscarriages. The first child, a female, died of pneumonia at the age of 6 months. All her life she was markedly jaundiced—"as yellow as a guinea." The second child, also a female, was aged 10, and was quite healthy. The third child was the present case. The mother and sister of the patient were examined; they showed no trace of jaundice, and no enlargement of the spleen; the blood, so far as the red and white cells were concerned, was normal; the serum could not be examined for bile pigment.

*Personal History.*—H. T. had been jaundiced since within a few weeks of birth. Except for being rather more readily tired than other children, he had been fairly strong. He had measles at the age of 4, from which he made a good recovery. He had had neither scarlet nor typhoid fever.

*Present Illness.*—The patient was referred for treatment by the School Medical Officer. His parents considered him to be in his usual health, and had ceased to lay much stress on his jaundice. His mother stated that he had been yellow since within a few weeks of birth. The jaundice varied in intensity; at some times it was quite marked, at other times it diminished considerably. She considered that on admission he was of unusually good colour. When the jaundice was most marked he was more readily tired and drowsy. He had never complained of pain in the abdomen. He had never suffered from epistaxis or other hæmorrhages.

*State in Hospital.*—The patient was a well-developed, bright, intelligent boy. His general nourishment was excellent. His skin was slightly jaundiced, and his conjunctivæ were definitely yellow. At irregular intervals the jaundice very definitely increased,

and the boy became drowsy and generally out of sorts. The visible mucous membranes were moderately pale. There were no hæmorrhages in the skin or retinae and no abnormal pigmentation of the skin. There was no clubbing of the fingers. Two or three small glands could be felt in the left axilla. Apart from changes in the spleen and blood, no further abnormality was discovered. The spleen was much enlarged and extended to one inch below the umbilicus. It was smooth, not tender, and it moved freely on respiration. The liver as a rule could not be palpated below the costal margin, but on certain days when he was more jaundiced it could just be felt, and he then rather resented palpation.

*The Urine.*—The urine was frequently examined during his stay in hospital; it never contained bile pigment, albumen or sugar. Urobilin could not be demonstrated on the two occasions on which it was tested for. The urine was, however, invariably high coloured—apparently due to excess of urochrome. As a rule the urine was free from a deposit of urates, which was, however, very marked on the days associated with an increase in the jaundice.

*The Stools.*—The stools were always well coloured and were usually of a deep brown colour. When the jaundice increased they became much more deeply pigmented, and were then of a very definite dark green colour.

*The Blood.*—Red cells, 2,800,000 per c.mm. White cells, 5800 per c.mm. Hb., 35 per cent.

*Red Cells.*—There was very marked anisocytosis, with numerous very large megalocytes, but the general tendency was undoubtedly to microcytosis. There was some polychromatophilic degeneration, especially affecting the megalocytes, but it was by no means general. Basophilic degeneration was also present in a small proportion of the cells. In one film, in counting 500 leucocytes, sixteen normoblasts and one megaloblast were seen. In other films the relative percentage of megaloblasts to normoblasts was considerably higher.

The white cells showed polymorphs, 58 per cent.; small lymphocytes, 35 per cent.; large lymphocytes, 2·2 per cent.; transit., 1·8 per cent.; eosinoph., 1·8 per cent.; mast., ·8 per cent.; myelocytes, ·4 per cent.

The blood-serum gave a very definite reaction for bile pigment. The Haig modification of Wassermann's reaction was negative. The resistance of the washed red cells to hypotonic solutions of saline solution gave the following results. As controls, the red cells of a case recovering from an attack of jaundice due to gall-

stones were used and also the red cells of a case of acute small-celled lymphatic leukæmia. The red cells of the leukæmia case showed marked changes on histological examination, including the presence of many nucleated red cells.

Saline Sol. 1 per cent.	H. T.	Leukæmia.	Gall-Stones.
	Hæmolysis slight	absent	absent
" .9 "	" "	" "	" "
" .8 "	" "	" "	" "
" .7 "	" marked	" "	" "
" .6 "	" "	" "	" "
" .5 "	" "	slight	" "
" .4 "	" complete	marked	slight
" .3 "	" "	complete	complete
" .2 "	" "	" "	" "
" .1 "	" "	" "	" "

Neither iso- nor auto-hæmagglutinins were present in the serum, and it showed no hæmolysins either for its own or for foreign red cells.

We have here a case presenting the features of chronic icterus dating from a few weeks after birth, marked splenomegaly, an apparently normal liver, and very definite changes in the blood. We may further emphasise the fact that the boy, in spite of the profound changes discovered on examination, was considered by his family to be quite strong, and was referred for examination by the School Medical Officer.

That these cases are not very rare and represent a definite clinical entity is evidenced by a review of the fairly extensive literature of the subject. Minkowski, at the Congress of Internal Medicine at Wiesbaden in 1900, first accurately described the condition in a report headed "Ueber eine hereditäre unter dem Bilde eines chronischen Ikterus mit Urobilinurie, Splenomegalie und Nierensiderosis verlaufende Affektion." In the family described by him eight cases occurred in three generations, all of whom presented chronic icterus and splenomegaly without impairment of the general health. There were no marked changes in the blood. On one of these cases an autopsy has been performed and will be referred to later. Hayem in 1898, under the title "Chronic Infectious Splenomegalic Icterus," described familial cases which have since been shown to be of the same nature. The family reported by Wilson in 1890 also probably belongs to the same group. More recently, important articles on this subject have appeared, especially by Chauffard, Gilbert and Lereboullet,

Krannhals, Parkes Weber, Hawkins and Dudgeon, Tileston and Griffin, and others.

From a consideration of the literature it is evident that the disease may appear in various types. Of these, the most striking is that in which it appears as a hereditary and familial affection occurring in several generations (*e.g.* three or four) and in several members of each generation. Examples of such cases are recorded by Minkowski, Hayem, Wilson, Krannhals, Barlow and Batty Shaw, Benjamin and Sluka, Hutchison and Panton, Tileston and Griffin (four families), and others. When occurring as a hereditary affection the disease affects males and females equally, and may be transmitted both by males and females. In some of the recorded families males only are affected, in others females only. So far no case has been recorded in which an unaffected member has transmitted the disease.

In a second type the disease appears as a familial affection, but no history can be obtained of its previous occurrence in the family. Examples of such cases are those recorded by Lereboullet and Hawkins and Dudgeon, and the present case.

In a third class we have isolated cases first appearing at birth or in early childhood, and there is a fourth type in which the disease first appears in early adolescence or adult life. This last type differs from the others only in the fact that the cases, as a rule, present much more severe symptoms than the hereditary or congenital cases. Strauss's and Oettinger's cases, in which autopsies have been obtained, belong to the acquired group.

The chief physical signs, *viz.* splenomegaly, changes in the blood and jaundice, will now be considered in greater detail.

*The Spleen.*—A splenic tumour is one of the most characteristic features of the disease, and has been present in the vast majority of the recorded cases, several of them having been reported as splenic anæmia. As a rule the enlargement appears early and is considerable, the spleen reaching to the umbilicus. In a few cases the enlargement has been much greater. There are, however, a few cases, which apparently must be included in the same group, in which the spleen has not been enlarged. One of the most convincing of these is the family reported by Benjamin and Sluka. In this family the grandfather, his son and his granddaughter were all affected with the disease. The son and granddaughter both showed very large spleens, but the grandfather, although he had been very definitely jaundiced all his life and showed considerable blood changes, presented an apparently normal spleen.



Pick has described a family in which the mother, two sons and one daughter were affected, but none of them showed an enlarged spleen. Mason and Parkes Weber have each recorded an isolated example of acholuric jaundice in a young adult in whom the spleen was of normal size.

*The Blood.*—In all cases bile is readily demonstrated in the blood-serum—it has been present in all the recorded cases in which it has been looked for. Urobilin is not present. One of the most characteristic features of the blood is a diminished resistance of the red blood cells to hæmolyzing agents. This was first described by Chauffard, and it has been confirmed by practically all recent writers. It is best tested for by exposing the washed red cells to hyper- and hypo-tonic solutions of saline solution and noting the point at which hæmolysis takes place. With normal blood, hæmolysis begins at about .4 per cent. saline solution. In congenital cholæmia Chauffard has shown that hæmolysis may begin with .7 per cent. or even .9 per cent. saline solution. This has been confirmed by Lereboullet, Möller, Parsons, Hawkins and Dudgeon, Hutchison and Panton, Vaquez and Giroux, Oettinger, Widal and Abrami and Brûlé, Tileston and Griffin, and others. Krannhals, using an imperfect method, also considered that in his family there was an increased fragility of the red cells. In most of the recorded cases hæmolysis has commenced between .6 per cent. and .7 per cent. saline solution. Parkes Weber failed to demonstrate any definite increased fragility in his case, but the reaction was carried out, not with the washed red cells, but with a few drops of blood diluted with normal saline. Bettmann also failed to demonstrate any increased fragility in his case by the method of Hamburger and Linbeck. Widal and Ravaut describe a case of congenital jaundice in a male aged 24 with an increased resistance of the red cells to hypotonic solutions of saline, but, as this case showed a megalocytosis instead of the usual microcytosis and an absence of splenic enlargement, it probably belongs to a different group. This increased fragility of the red cells is the more remarkable as it has been repeatedly shown by many observers that the resistance of the red cells to hæmolyzing agents is definitely increased in obstructive jaundice. Widal, Abrami and Brûlé have shown that the hæmolysis depends solely on the fragility of the corpuscles, and that the plasma and serum are normal. Chauffard has further shown that the increased fragility is evident when tested with other hæmolytic agents, such as eel and antihuman serum.

A second characteristic of the red blood cells which Chauffard first described is a very distinct tendency to microcytosis. This also has been generally confirmed; and is quite opposed to the megalocytosis usually observed in cases of obstructive jaundice.

Hæmoglobin has been found in the blood-serum in only two cases, those of Bettmann and Chauffard. In Bettmann's case attacks of paroxysmal hæmoglobinuria occurred on two occasions and the jaundice was always much increased by exposure to cold. Neither auto- nor isohæmo-lysins have been found in the blood-serum, though frequently looked for. Hawkins and Dudgeon have described in two of their cases (sisters) the presence of a specific hæmagglutinin. No hæmagglutinin was found in our case or in the cases of Hutchison and Panton (two cases), Poynton (three cases), and Parsons.

In addition to the increased fragility of the red cells and the microcytosis, the blood as a rule shows further definite histological changes. In some of the older cases no very definite changes are described in the blood, but in the great majority of the more recent cases there has been a very definite anaemia with a red cell count ranging from 4,000,000 to 700,000 per c.mm., an average count being about 2,500,000. The lowest counts occur in cases of the acquired type, which may closely simulate an advanced case of pernicious anaemia. Poikilocytosis is occasionally present, but much more frequent is marked anisocytosis, with a distinct tendency to microcytosis. Polychromatophilic and basophilic degeneration may also be marked. Nucleated red cells are frequent (Chauffard records them as high as 5.5 per cent. of total red cells), sometimes normoblasts and sometimes megaloblasts preponderating.

Guimon, Rist, and Simon have described one acquired case in a girl aged 10, who showed the usual symptoms of chronic acholuric jaundice of variable intensity, urobilinuria and splenomegaly, but who, in addition, suffered from transitory attacks of cyanosis and increase of the jaundice. During the attack the red cells rose to 6,000,000-7,600,000 per c.mm. Mosse has recorded a somewhat similar case, but, as it developed in a male aged 58, there is considerable doubt if it belongs to this group.

The leucocytes are generally present in normal numbers and show no constant abnormality in their relative proportions. In some cases a slight relative excess of the polymorphonuclears has been present (Tileston and Griffin, 80 per cent.) but in others there has been a relative lymphocytosis (Bettmann, Barlow and Batty

shaw). Myelocytes in small numbers are frequently present, but they have been recorded as high as 9 per cent. (Möller). Mast cells also are frequently met with in small numbers.

The hæmoglobin is diminished in proportion to the red cells, the colour index usually being about normal or rather less.

*The Jaundice.*—Jaundice is one of the essential features of the disease, without which the diagnosis cannot be made in any but familial cases. It varies considerably in intensity; in many cases it is stated to have been as marked as is usual in catarrhal jaundice, in others it has been much less marked, though the conjunctivæ are always definitely coloured. In all, bile pigment is readily demonstrated in the blood-serum. It never passes into the green or black jaundice seen in malignant or congenital obstruction of the bile ducts. It seems possible, however, that there may be incomplete cases without definite jaundice, as some of the members of affected families have shown only anæmia and splenomegaly without jaundice (Chauffard and Troisier, Parkes Weber). In many cases the jaundice varies in intensity from time to time, and it is not unusual, as in our case, to find that the days associated with the more intense jaundice are accompanied by a heavy deposit of urates in the urine and a general sense of diminished well-being. In Bettmann's case the crises of increased jaundice were distinctly related to excess in eating and drinking, mental and certain bodily strains, and, above all, to exposure to cold. In other cases the jaundice becomes more marked during the warm weather.

*The Urine.*—In the great majority of the cases, bile pigment is constantly absent from the urine, in a few it has been noted in small amount at rare intervals. Urobilin is generally present. Bettmann's case occasionally suffered from attacks of paroxysmal hæmoglobinuria, but this is no feature of the disease. In a considerable number of the cases it has been noted that the urine at irregular intervals showed a heavy deposit of urates, and at those times the jaundice increased and there was more or less impairment of the general condition. Apart from these abnormalities, the urine is quite normal.

*The Stools.*—In all cases the stools have been well coloured. Möller has shown that the total urobilin excretion in the urine and faeces is considerably increased. Tileston and Griffin have shown that the neutral fats, fatty acids and soaps are present in normal proportions. In our case we may emphasise the fact that, on the days associated with an increase in the jaundice, the

stools were always very definitely more deeply coloured with bile.

*The Liver.*—In the great majority of cases the liver has been found normal in size on physical examination; in a few cases it has been described as at times slightly enlarged, but very rarely has it extended more than a finger's breadth below the costal margin. In a case described by Claus and Kalberlah there was a very marked enlargement of the liver, which ultimately diminished in size. A brother suffered from chronic jaundice without hepato- or spleno-megaly. As there was no increase in the fragility of the red cells there is some doubt if the case belongs to this group. Roughness and irregularity of the surface of the liver have never been described.

*General Features of the Disease.*—One of the most remarkable features of the condition is the frequent absence of any symptoms of disease. Not a few of the familial cases, who were found to present all the characteristic features of the disease, were discovered only during a systematic examination of the family. Hawkins and Dudgeon's Case I. was a policeman, aged 27, who had shown all his life jaundice as intense as an ordinary catarrhal jaundice. His spleen extended to his umbilicus and his red cells were reduced to 3,676,000 per c.mm. and showed marked poikilocytosis and the presence of megaloblasts. In spite of this, he was, and—except for an attack of pleurisy five years before—had always been, in perfect health and able for full duty. He came up for examination solely on account of his colour, which had frequently given rise to remark.

The condition appears to have little tendency to shorten life. One of Benjamin and Sluka's cases dating from infancy was alive at 81. Both Tileston and Griffin's cases died at 74. Minkowski's and Oettinger's cases died of an intercurrent pneumonia at the ages of 42 and 67 respectively; Wilson's case died in childbed, and Gandy and Brülé's of typhoid fever; in the cases of Vaquez and Strauss death followed splenectomy and cholecystectomy respectively. The females can bear large families with impunity. At times, however, some even of the congenital cases show exacerbations, accompanied by slight pyrexia, a deepening of the jaundice, and an increase in the anaemia. At such times the cases may look very ill, and, unless a correct diagnosis be made, a very erroneous prognosis may be given. The acquired cases, as a rule, tolerate their condition much less readily than the congenital or familial, and in them it is the exception rather than



the rule to be without symptoms for any length of time. Pigmentation of the skin other than the jaundice is no feature of the condition. Repeated epistaxis is not infrequent, and, more rarely, hæmorrhage from the gums occurs. Parkes Weber has recorded an acquired case which showed a few retinal hæmorrhages and a few purpuric spots on the legs. Hæmorrhages from the stomach and bowel, so frequent in the Banti syndrome, have not been observed. Attacks of pain over the splenic region, probably due to perisplenitis, have occurred in several cases. Attacks of true biliary colic due to complicating gall-stones have also been present in some cases. In not a few of the cases, as in our case, the urine at irregular intervals has shown a heavy deposit of urates. On those days the patients are "off colour," both literally and metaphorically. Ascites or any other sign of venous engorgement has not been noted.

*Pathology.*—Autopsies have been performed in eight cases. Six of those (Minkowski, Wilson, Vaquez and Giroux, Gandy and Brûlé, Tileston and Griffin (two cases)) were of the familial type, while those of Strauss and Oettinger were of the acquired type. In both types the condition found has been the same. The liver has been found normal in size, or very slightly enlarged (Wilson). There have been no cirrhotic changes and no obstruction of the bile ducts. Except in Tileston and Griffin's second case, there has been no evidence of cholangitis; in their case the cholangitis was evidently due to complicating gall-stones. In Wilson's and Minkowski's cases there was also some fatty degeneration of the liver cells, which was probably associated with the terminal infection (*vid. supra*). In five of the cases gall-stones were present, and in Wilson's case the gall-bladder was not examined. In all, the spleen has been much enlarged. In most of the cases there has been more or less perisplenitis. The increase in size of the spleen was due mainly to an increase of the pulp, which was enormously engorged with red cells. In Tileston and Griffin's second case and in Wilson's case there was also some splenic fibrosis. In all there was a greater or less deposit of pigment in the spleen, mainly within the endothelial cells. In most of the cases there was also a variable amount of pigment in the kidneys, and in both of Tileston and Griffin's cases and in Wilson's case there was some fibrosis of the kidneys. The bone marrow in Tileston and Griffin's cases was in a state of intense reaction, with red marrow throughout the femur.

*Pathogenesis.*—Most of the recent writers are now agreed that

the condition is a hæmolytic jaundice, associated with the diminished resistance of the red cells. All the features of the disease have been produced in rabbits by Lesné and Ravaut by the injection of hæmolytic agents. Whether this increased fragility of the red cells is due to a congenital defect in the blood-forming organs or is the result of a congenital defect of metabolism leading to the production of hæmolytic toxins is unknown.

#### DIFFERENTIAL DIAGNOSIS.

*Splenic Anæmia, especially of the Family Type.*—Family cases of splenic anæmia of the ordinary type, although not common, have been described by Levy, Springthorpe and Stirling, and Sutherland and Burghard. In this condition we have marked splenomegaly without hepatomegaly, accompanied by changes in the blood of a chlorotic type. The histological structure of the spleen in those cases is quite different from that seen in congenital family cholemia. Clinically, the cases of splenic anæmia differ in the absence of jaundice, the presence of pigmentation of the skin, and probably, though this has not yet been sufficiently demonstrated, the presence of a normal fragility of the red cells. As a rule, also, the histological changes in the red cells are not so marked in splenic anæmia; this is not an absolute rule, as in the younger members of Springthorpe and Stirling's family there were very definite changes in the red cells. In the cases which pass on to the full Banti syndrome, jaundice may develop, but there is then definite evidence of cirrhosis of the liver, and, generally, repeated gastro-intestinal hæmorrhages occur.

*Splenic Anæmia of the Gaucher Type.*—The Gaucher type of splenic anæmia has a much more definite tendency to a familial incidence. Family cases have been reported by Brill, Collier, Bovaird, and Schlagenhauser. So far, no case has been reported showing hereditary transmission. These cases show a unique pathology, and clinically they differ from cases of congenital cholemia in the immense preponderance of females affected (thirteen out of fourteen), in the presence of marked enlargement of the liver, and in the absence of definite blood changes. A brownish-yellow discoloration of the skin, differing from that of true jaundice, is frequently present; it was marked in one of Brill's cases in which there was no trace of bile pigment either in the urine or in the blood-serum. Jaundice was present in Gaucher's case and was marked in Risel's case, which showed

the constant presence of bile pigment in the urine during three months' observation.

*Hypertrophic Cirrhosis of the Liver.*—This condition also appears as a family disease, presenting the features of chronic jaundice with enlargement of the liver and spleen. Family cases have been reported by Finlayson, Boinet, Osler, Dreschfeld, Hasenclever, Parkes Weber, and others. Clinically these cases show, in contradistinction to chronic family cholemia, marked liver enlargement. Further, when it occurs in children the development of the child is usually retarded, both mentally and physically. Itching of the skin is much more pronounced, and clubbing of the fingers is frequently present. The jaundice is more marked, and bile pigment is practically always present in the urine. The blood changes are insignificant.

*Congenital Obliteration of the Bile Ducts and Obliterative Cholangitis.*—Familial and isolated cases of congenital obliteration of the bile ducts, more or less complete, are not very uncommon. These cases show marked jaundice developing within a short time of birth, spleno- and hepato-megaly, and a tendency to hemorrhages from various parts of the body. The great majority of the cases die within ten months of birth, but a few cases in affected families have been known to recover. They are readily differentiated from cases of congenital family cholemia by the intensity of the jaundice, the presence of large amounts of bile pigment in the urine, the acholic stools, and hepatomegaly. Further, as in other forms of obstructive jaundice, the blood tends to show an increased resistance to hæmolytic agents and a definite tendency to megalocytosis.

*Inherited Syphilis.*—In congenital syphilis, cases, frequently familial, are met with presenting the features of splenomegaly, hepatomegaly, and anæmia. These cases do not show jaundice without definite changes in the liver; the presence of other syphilitic stigmata and a positive Wassermann reaction would be decisive.

*Pernicious Anæmia.*—Congenital cases of congenital family cholemia do not, as a rule, present an appearance suggestive of pernicious anæmia, but some of the acquired cases in which the general condition is much more adversely affected may closely simulate the rare cases of pernicious anæmia with marked splenomegaly. Such cases of congenital family cholemia have been described by Chauffard and Parkes Weber. A recent case reported by Rudolf and Cole, which they consider to be probably

a case of pernicious anæmia or atypical splenic anæmia, appears to us to be of this nature. The diagnosis from pernicious anæmia must depend upon the long duration of the illness and the presence of acholuric jaundice. Whether any great stress in differential diagnosis can be laid on the presence of increased fragility of the red cells in congenital cholemia is still doubtful, as the evidence as regards the fragility of the red cells in pernicious anæmia is contradictory.<sup>1</sup>

*Leukanaemia.*—This condition was described by Leub, who considered it a combination of leukemia and pernicious anæmia. It is now more generally believed to be an atypical form of leukemia. In these cases we have splenomegaly and marked changes in the red blood cells without any very great increase in the white cells. There is no tendency to a family incidence in this disease. The cases are much more acute than those of congenital family cholemia, the leucocytes on the whole tend to be definitely increased in number and show a higher percentage of myelocytes, and there is an absence of jaundice or cholemia.

*Treatment.*—Many of the congenital cases are in a condition of equilibrium and require no treatment. Arsenic has been found to be of little use, if not actually harmful. Splenectomy has been done in only one case (Vaquez), with fatal result. Operation for the relief of complicating gall-stones has been performed in two of Tileston and Griffin's cases with success. In Strauss's case, cholecystectomy was followed by death on the third day.

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## SOME OPERATIVE PROCEDURES ABOUT THE KNEE-JOINT.

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THERE are some conditions of the knee-joint where the chief symptoms are intermittent attacks of pain, with synovitis and hydrops. The first attack has generally been the result of traumatism, from which the patient has recovered with rest and external applications. Later the attacks have recurred without any very severe injury, in fact often after nothing more than a false step. Though the pain in these later attacks is not so acute, it remains longer as a hot gnawing feeling, confined generally to the inner side of the joint, close to the semilunar cartilage and the patella. The swelling of the knee never subsides sufficiently to allow the outline of the knee-cap to be as distinct as in the sound limb. Some of the conditions of the joint giving rise to these symptoms may be diagnosable before operation, but others can only be surmised, and the true state of affairs is made plain only when the joint is opened. The limb is so unreliable or the pain is so constant that both patient and surgeon decide on operation.

Operations on the knee-joint are even yet considered rather risky, but there is no reason, so far at least as sepsis is concerned, why the knee-joint or any other joint may not be opened as freely as the abdominal cavity. The mistake in most cases is that openings are not made large enough in the class of cases under consideration. This is due mainly to the dread of infection, and also in no small measure to the fear that a weak or useless joint may result. The pioneer, at least in this country, the late Mr. Amundale of Edinburgh, opened the knee-joint very freely by a transverse incision, and his results, in the antiseptic age of surgery, were very satisfactory. Allingham, dreading mostly the weakening of the lateral ligaments, used vertical incisions, but these scarcely gave sufficient room for a free examination of the joint. As the pain is usually located on the inner and anterior aspect of the joint, it is better to make the opening on the inner side, the skin flap having its convexity upwards. The base of the flap should be about 3 inches in length, parallel to and an inch below the head of the tibia, and the highest point of the flap

should extend an inch or more above the internal condyle. This flap, containing skin and all tissues down to the lateral ligament or muscles and tendons, is dissected downwards and held back at its base. The joint is then opened a little inside the edge of the patella, and another flap, whose curve follows closely the curve of the condyle, is turned up so that the joint cavity may be freely examined. The division of the capsule is made midway between its attachment to the condyle, tibia, and patella, so that suturing may be easier later. The knee during the whole operation should be kept in a semiflexed position. With this opening the joint can be fully and easily examined, both by sight and with the finger. A semilunar cartilage may have to be fixed or removed, loose melon-seed bodies may be found in the joint, or the ligamenta alaria or mucosum may be loose or hypertrophied and require removal, trimming, or fixing. The inner alarial fringes are generally the larger, but a second incision may be made vertically on the outer side of the patella to allow the fringes there to be dealt with. If there is hydrops, and no evident cause for it, the knee-joint may be permanently drained into the anterior tissues of the thigh as follows:—

A stout silk No. 10 ligature is threaded through the eye of a long probe, which is pushed, eye first, through the uppermost part of the wall of the synovial sac, and onwards for 4 to 6 inches through crural and quadriceps muscles, and made to protrude under the skin in front of the thigh. The end is cut down upon and pushed out. The silk suture is caught and the probe withdrawn. The lower two ends of the silk thread are cut across, so as to be equal in length, and a pair of artery forceps attached to them. The upper part is then pulled up until the lower ends lie clear of the patella. The loop in the thigh is divided, and one end is threaded on an aneurism needle and made to take a bite of the muscle sheath when the two ends are tied together. This fixes the silk drain so that it cannot work down into the knee-joint and cause trouble later. The forceps is pulled upon at the lower end, in case the part protruding into the joint is left too long. Before closing the joint all free bleeding should be stopped, but if there is still oozing, as there may be when the alarial fringes have been snipped, a glass button drain is left in for the first twenty-four hours. The synovial membrane is sutured first with fine silk, and when the capsule is loose this suture may be made to overlap or fold outwards like an inverted Lembert. The ligaments, tendons, and other fibrous structures are then firmly sutured

together with a continuous silk suture and the skin wound closed. A sterile dressing is left on for ten days, when the skin stitches are removed. The limb at first is firmly bandaged to a back splint. Gentle passive movement is done when the wound is dressed, and daily after the sutures are removed. Gradually the range of movement is extended till the splint is left off, three weeks after operation. The following are illustrative cases:—

J. G., a girl of 18, a jute-spinner, had suffered from swollen knees for five years. Both were affected, the left being the worse. There was a good deal of pain on movement of the joints, some fluid could be made out in both, and the synovial membranes felt thickened. She came under my care first in October 1909, and was treated by 10 gr. doses of *Ac. acet. salicyl.* three times daily. Bier's bandage was applied for an hour daily and moist heat locally. The fluid disappeared in about a week, but she complained of pain in the left ankle, though there was no swelling. Reference to old case-sheets during her previous treatment in the Infirmary suggested a possibility of the arthritis being specific. A gonococcal origin was also suspected from genital symptoms, but no organisms were found. At these times, 1906 and 1908, she had been treated by Scott's dressing, aspirin and rest, and had been dismissed "improved."

Bier's bandage and the aspirin improved the condition so much that she was able to be sent home in a month. She was readmitted a week later with the condition as bad as ever. Both knee-joints were tense with fluid, as shown by the bulging on either side of the patella. There was much pain on movement and when she attempted to walk. In bed the knees were held slightly flexed and any attempt at extension or flexion caused severe pain. Palpation on either side of the patellar ligament gave a fine velvety-like grating. The joints were opened by vertical incisions on both sides of the patella. The synovial membrane was thickened by inflammation and the alar fringes were lengthened and thickened, and the tips of the fringes were in some cases hard and cartilage-like. These were trimmed off. No loose bodies were seen. Silk drains were put in through the extensor quadriceps and fixed to the sheath or the muscle in front. Both limbs were then firmly bandaged to long posterior splints. There was considerable pain after the operation, and the bandages were loosened. The patient was allowed to walk at the end of a fortnight, and when seen nine months later she had had no pain and no swelling in either joint, and the silk drains seemed to give



no trouble. Now the condition is much the same, though she has been working regularly. She says she feels the knots on the front of the thigh sometimes, *e.g.* when she rises off a chair.

The other patient suffered from a synovitis in the left knee-joint, which was not improved by any treatment except rest, and, as the condition was constantly recurring, the man was almost incapacitated from attending to business. The original injury dated back six years, when he twisted his leg during a game of tennis. There was a suspicion of loose internal cartilage. The joint was opened by a crescentic incision, the cartilage was found firm, and, with the exception of a slight swelling and inflammation of the alar ligament, no cause was found for the synovitis. A few fringes were snipped off and a silk drain put in. The knee now gives no trouble, seven months after the operation.

Persons with genu valgum seem to suffer more frequently from chronic synovitis after slight injuries to the knee-joint than do those with normal limbs, and, when the knee-joint has been opened as described, it is easy to separate the internal condyle as first suggested by Ogston, and thus correct the deformity.

The following case explains the method adopted with success:—

C. T., aged 19, a rope-worker, twisted his right knee while running, and could not straighten the leg at first after the accident. Then something seemed to slip back into position, the pain ceased, and he was able to walk. The knee swelled considerably afterwards and he had to rest. This was in June last. He was admitted to my ward on the 7th July, the knee having been injured by a coil of rope falling against it. Previous to this, however, he said "he had knocked this knee out about four times a day" since the original accident. He suffered also from a bad genu valgum, the tibia making an angle of 150 degrees with the shaft of the femur.

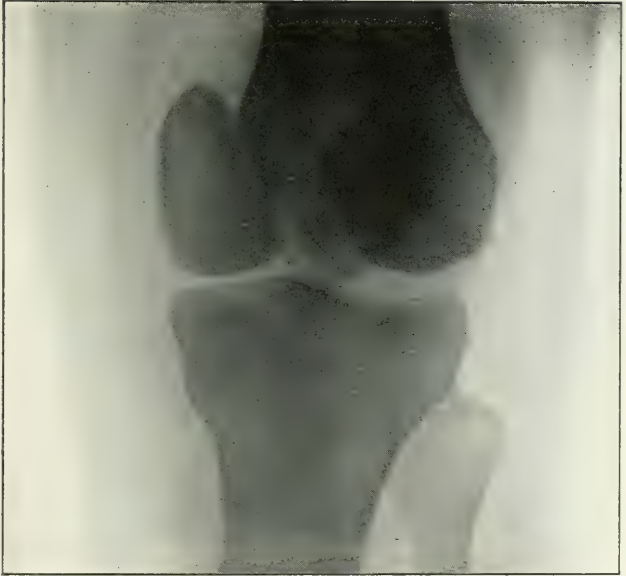
Injury to the internal semilunar cartilage was diagnosed and operation suggested. Under  $\text{CHCl}_3$  a crescentic flap with its vertex upwards was made, beginning just below and to the inner side of the patella. The incision was carried along the anterior border of the internal condyle, upwards until it reached well above the condyle, then downwards again along the anterior border of the sartorius. This flap of skin and subcutaneous tissues was turned downwards well below the head of the tibia. When the joint was opened a loose semilunar cartilage was found lying in front of the femur. It could easily be pushed backwards underneath the

condyle. It was split on its inner side at about the junction of the anterior and middle thirds, which were held together by a thin band circumferentially.

The joint was held open by pressure over the external condyle and the cartilage removed with knife and forceps. The transverse opening allowed this to be easily and completely accomplished entirely within sight, which is a distinct advantage over having to remove the cartilage with a pair of scissors assisted only by touch, as has to be done with a vertical incision. It was decided to correct the genu valgum by sawing off the internal condyle as follows:—

A pair of Kocher's forceps was entered in front of the condyle and pushed out through the fibres of the vastus internus muscle. The end of a Gigli's saw was caught and pulled into the joint cavity. The forceps was then entered from outside at the posterior border of the vastus muscle and pushed towards the finger, which was placed in the intercondyloid space as a guide. The same end of the saw was grasped and pulled out, and the loop now inside the joint was put round the condyle. The attachment of the posterior crucial ligament limits the saw centrally, and if the openings are properly made through the muscle the curve of the saw will embrace the whole of the condyle. The two points of exit are about an inch and a half apart, or just the width of the condyle at its junction with the shaft. Care has to be exercised so as not to enlarge these openings too much during the process of sawing. When the condyle has been almost sawn through, a chisel is entered in the saw-cut and the condyle prised away. A good view of the saw track can be had, and any irregularity caused by the fracture planed off with the chisel. The periosteum is next pushed off the shaft for a quarter of an inch or more with an elevator, and the condyle, when placed again in position, is pushed up as far as necessary. No pegging is used. The joint is closed in layers and a glass drain left in at the anterior angle. The leg is bandaged to a posterior splint, the genu valgum being rectified during the bandaging. (See radiogram.)

Mikulicz held that the deformity of knock-knee was entirely due to a bending of the shaft of the femur above the epiphysis; but even if his theory be correct, the method here used may be satisfactory. But Mikulicz's own diagram is not quite convincing. Though the bend in the shaft is evident, there seems a decided widening of the epiphyseal line internally, and there is at least something to support the theory of Hüter that there is increased



Radiogram C. T. Condyle sawn off and pushed up.





bone production both on the condyle and the shaft side of the epiphysis. As the operation was described by Ogston, there is considerable danger of injuring structures about the joint, and some unsatisfactory results have been recorded. But severe consequences have followed the apparently simpler operation of osteotomy, whether done through the shaft or just above the condyles.

The knee was painful the night following the operation. Next day the leg was dressed and the glass button drain removed. The stitches were taken out on the tenth day and the splint was removed at the end of the third week. Movement was then begun and extension applied to the leg for another ten days. Passive movements were given to the joint daily. The extension was kept on at night for another week, after which the boy was allowed to get about on crutches but not to put the leg to the ground. The crutches were dispensed with four weeks later, and now three months after the operation, he is hardly lame at all, though there is still some hydrops. The silk drain was not used in this case.

The next patient illustrates the condition described by Allingham as inflammation and rupture of the alar ligaments. The history points to an injury of the subpatellar pad of fat, which had spread backwards and inflamed and thickened the ligamentum mucosum and ligamenta alaria. These ligaments are really prolongations backwards of the subpatellar pad, covered by synovial membrane, and attached behind to the intercondyloid notch of the femur and at the sides to the patella. When these ligaments get thickened from inflammation, they tend to shorten, and it is easy to see that straightening of the leg is prevented both by the pain caused from squeezing the ligament between the femur, the tibia and patella, and also by the stretching of the ligament when the femur is fully extended. The ligament becomes thickened and shortened permanently, and if the leg is straightened the posterior attachment is torn from the femur. This is generally the condition found when the joint is opened, and the method of rectifying it is to remove a part of the ligament along with the exuberant fringes. Allingham proposed to fix the free end by a suture to the capsule.

The latter method would not have got rid of the thick pad which kept the joint from being extended, as the ligamentum mucosum was detached behind and was squeezed against the ligamentum patellæ on full extension.

J. H., aged 24, while in domestic service three years ago, knocked her knee in front by falling on the stairs. It remained painful for some time, and one day shortly after the fall she knelt on a stone and hurt it worse. Since then the knee has always remained a good deal swollen and painful. On examination the leg was found in a position of slight flexion. There was marked genu valgum. There is an old scar on the inner aspect of the thigh just above the internal condyle; this was left after an operation performed thirteen years ago for some bone trouble. The knee was white in colour, swollen, especially anteriorly, and puffy at the sides of the patella. Fluid was easily made out in the upper pouch. The range of movement was—flexion to a right angle and extension to within about five degrees of normal. The condition was diagnosed as inflammation of the ligamenta alaria and mucosum. A flap was turned up at the inner side of the knee and the joint opened as in the previous cases. A thick pad of inflamed fatty tissue replaced the mucose and alarial ligaments and protruded into the joint under the patella. The surface of this mass was irregular and free, red at places, while some projections on it seemed jelly-like or cystic. There were no fringes representing the alarial ligaments nor protruding between the condyles. A transverse wedge from this mass was removed and the internal condyle was sawn off to correct the knock-knee. The joint was closed without drainage. There was a good deal of pain, probably due to the tight bandaging, but it was relieved by an injection of morphia. There was no rise of temperature, and the wound was dressed on the ninth day and was found to be healed. There is still some pain on pressing over the external condyle, but the leg is in a normal position. Passive movement was begun as before at the first dressing, but, owing to the pain, was omitted for two days thereafter, when extension replaced the splints. She has now no pain in the joint, except when forcibly flexed. A von Pirquet was negative, and it is possible that the external side of the ligament may be hypertrophied. The operation was performed eight weeks ago, and the condyle is firmly united.

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## FUNGUS INFECTIONS OF THE FINGER-NAILS.<sup>1</sup>

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IN his handbook of *Diseases of the Skin* (1907), Whitfield states that fungus infections of the nails are probably commoner than is generally supposed. That statement is borne out by the fact that within the last three years I have had the opportunity of observing no fewer than 19 cases; 17 of these were seen as out-patients in the Skin Department of the Royal Infirmary under Dr. Norman Walker's care, and to him I am indebted for permission to record them. For one case, which was an out-patient at Leith Hospital, I am indebted to Dr. Langwill.

I do not propose to describe each case separately. They fall into three groups, viz.—(1) Ringworm of the nails; (2) Favus of the nails; (3) a Fungus Infection of the nails of unknown origin.

As the cases of ringworm form the most important group, they will be dealt with first. There were 16 of these ringworm cases, 14 of which belonged to Edinburgh and 2 to Leith.

A curious fact was the predominance in the female sex—only 2 being in males. This predominance is difficult to explain. Török says that *tinea unguium* is commoner in those who manicure the nails, and probably injure them in so doing, but the majority of our patients were not of the class which bestows much care on the nails. It is possible that the frequent washing of infected material, *e.g.* clothes, &c., may be the reason why females so frequently suffer.

Ringworm of the nails may occur at any period of life. The youngest of my cases was 11, and the oldest 58 years of age. The majority were girls of between 20 and 30 years. This age-incidence corresponds more nearly to that of *tinea corporis* than of *tinea capitis*.

Ringworm of the nails is very rare in children with ringworm of the scalp. Sabouraud, in l'Ecole Lailler, where there were always about 300 children with ringworm of the scalp, in four years saw only 2 cases where the nails were affected. This infrequency of nail infection in children with ringworm may be partly

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due to the fact that ringworm of the nails is always due to the large-spore fungus, but even amongst children suffering from large-spore tinea of the scalp nail affections are very rare. I think the most probable explanation is, that because tinea capitis so rarely causes any itching there is no tendency to scratch and so infect the nails. The inflamed ringworms (kerion) are also too tender to allow of scratching.

*Source of Infection.*—The source of infection was difficult to trace in many of the cases. In only 1 of the 16 cases did the patient suggest that the disease was due to an infection from anyone else. The patient blamed the washing of clothes worn by her husband and son, who had what was apparently tinea barbae. In all the other cases the patient had no idea of the condition being a contagious one. In another case there is also little doubt that the disease was contracted from her brother who, I know, had tinea barbae at the time when her nails became infected, but as cultures were not made from the brother's beard I cannot say whether or not both conditions were due to the same fungus.

Two of the cases were husband and wife and other two were sisters, and in these cases there was probably either a common source of infection or infection the one from the other.

One woman was undoubtedly infected from her children, who had tinea capitis of large-spore variety. In washing and rubbing their heads she contracted ringworm of the hands and fingers, the disease later spreading to the nails. In this case cultures showed that the same fungus was present in the nails as on the children's heads. This method of infection has been previously described by Vidal, who noticed that nurses who epilated ringworm cases at the Hôpital St. Louis in Paris frequently became infected with ringworm of the nails.

In all the other cases absolutely no source of infection could be traced either from previous lesions on their own skins, from infection from their relatives or friends, or from animals. Each patient was particularly questioned with regard to these points.

In two cases there was a history of injury to the nail shortly before the disease began, and it is possible that infection may have taken place at that time.

One case was associated with spoon-nails (coilonychia). The spoon-nail was well marked in all the nails, and possibly such nails are more liable to fungus infections than normal ones.

*Duration.*—The duration of the disease varied from three weeks up to seven years, the average time being about four years. Only



a very few of the cases had been previously treated, and in some the disease was discovered accidentally, when the patient came complaining of some other condition.

*Extent.*—The number of nails affected in each case varied from one up to seven. No one nail was more often affected than another. In one-half of the cases both hands were affected, in the other half only one hand. In the 8 cases of the latter group, 4 showed the disease on the right hand and 4 on the left. In none of the cases were the toe-nails affected.

*Diagnosis.*—The diagnosis in all cases was comparatively easily made, the appearance of the nails being very constant. In all previously recorded cases the authors lay stress on the splitting up and splintering off of the free margin of the nail. This is characteristic of the disease, but as the patients often clip away any loose parts, the nail frequently does not show this to any great degree. The colour of the nails has been variously described from a yellow-white to a brown or black colour. In nearly all my cases I have found that there are definite zones presenting different colours and appearances, these zones being very constant in arrangement. The infection seems to take place from the under surface of the free margin of the nail. At the tip the nail becomes undermined, dark in colour, and softer than normal, so that if a blunt instrument be inserted under it some of the softened nail substance can be easily removed. The disease slowly spreads up the nail, and as it spreads the nail becomes more broken up, till finally, when the whole of it is infected, the free margin breaks off in splinters of a dirty white colour. These broken parts at the tip are easily removed. Then comes a zone where the nail is light yellow in colour, longitudinally striped with darker lines. At this level pieces of the nail can be scraped off only with difficulty. Further up still there is a peculiar dark yellowish-red zone, fairly smooth on the surface, and showing very little tendency to split up. These three zones were distinctly seen in most of the affected nails, and appear to me to be very characteristic of the condition, more especially the yellow-red zone at the upper part. This yellow-red smooth area represents the spreading edge, where the infection is only just beginning. In the light yellow area further down, the nail is permeated with the fungus, but not yet sufficiently so as to cause the nail to break up. The tip is the part of the nail which has been longest infected, is thoroughly permeated by the fungus, and so is split up and cast off. These zones look as if they were stationary, whereas in reality the upward growth of the fungus is simply keeping pace with the downward growth of the nail.

In addition to these colour changes and splitting up, there is also in many cases a heaping up of the nail into irregularly arranged prominences with dark blackish-brown depressions between. When the nail remains flat the nail substance is probably the only part affected with the fungus, but when it becomes raised up and distorted the nail-bed is probably also affected. In many cases the lunule has disappeared altogether, and the tissues at the base of the nail are red and somewhat swollen. In such cases the nail is very distorted, and it is an indication probably that the growing nail matrix is invaded by the fungus. Apart from the disfigurement there are no symptoms associated with the disease.

*Microscopic Appearances.*—In all the cases the diagnosis was confirmed by microscopic examination. Pieces of the nail were scraped off with a sharp spoon or clipped off with scissors, put in liquor potassæ (6 per cent.) and gently heated for a few minutes. They all showed the same appearances. Inside the nail substance branching mycelium and spores are to be seen. The spores are square in shape and arranged very characteristically in rows. If the fungus is not visible at once the pieces of nail should be left in the caustic potash over night, and if it is present at all there is no difficulty in seeing it next morning. In some of the cases fungus was not found in the first pieces of nail examined. Therefore in all cases of suspected fungus disease of the nails scrapings should be repeatedly examined. I would also strongly recommend that in every case where a patient presents a splitting up of the nails, which does not affect all of them, that a thorough examination be made for the presence of fungus. Finding of the typical fungus is proof positive of ringworm, but the failure to do so on first examination does not necessarily exclude that disease.

An attempt was made to stain the fungus in the nails by gentian violet and other stains, but the results were not satisfactory. For all practical purposes the caustic potash method is quite sufficient.

*Cultures.*—In order to determine the kind of fungus present cultures were made from the nails of 8 of the patients. Pieces of nail were scraped or clipped off and placed for 2 or 3 minutes in absolute alcohol. Whilst in the alcohol they were broken up into as small pieces as possible. These were allowed to dry for a few minutes and then implanted on Sabouraud's proof medium, which contains 4 per cent. maltose, 10 per cent. peptone, and 1.5 per cent. agar. The cultures were kept at a temperature of 20° C. Some

PLATE I.

Ringworm of the finger-nails.

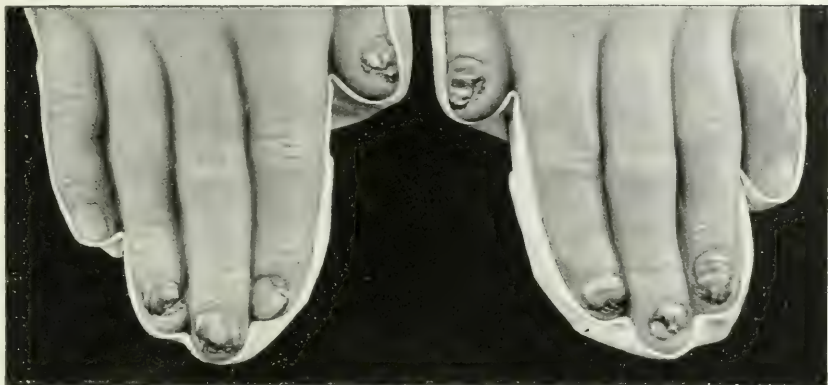






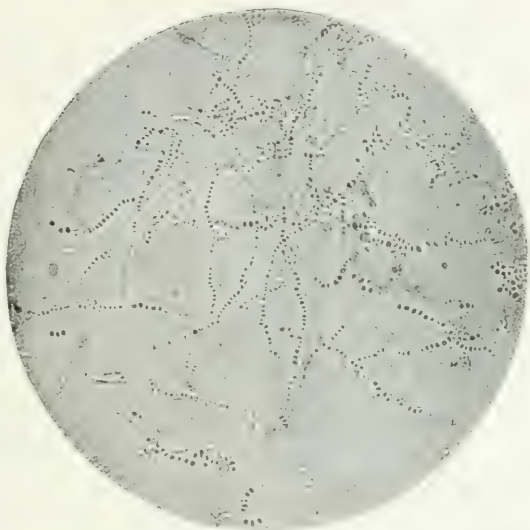
PLATE II.

Ringworm of the finger-nails.





PLATE III.



Ringworm fungus in finger-nail. Mounted in liquor potassae.  
( $\times 400$ .)



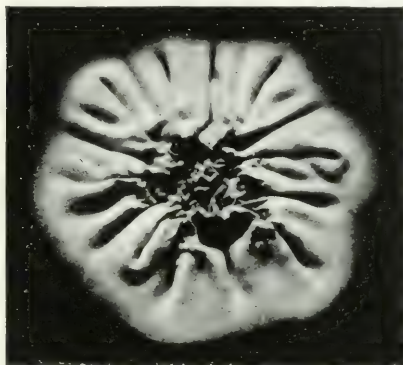
Same as above. (Oil immersion.)



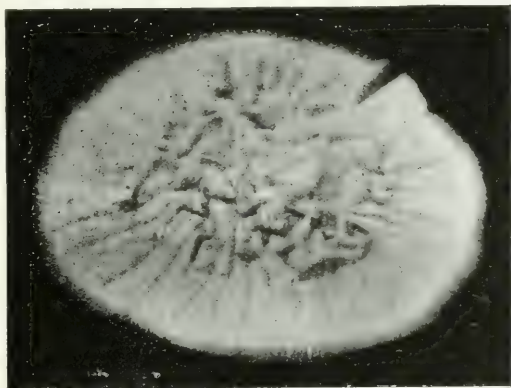


PLATE IV.

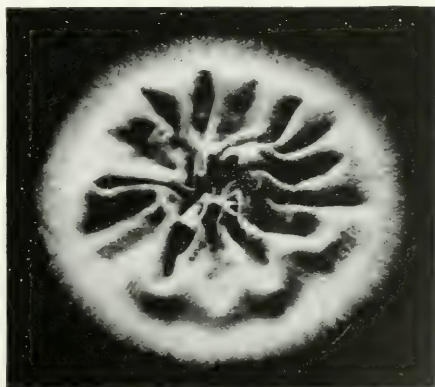
Cultures (about six weeks old on Sabouraud's medium) of fungi  
from finger-nails.



*Trichophyton accuminatum.*



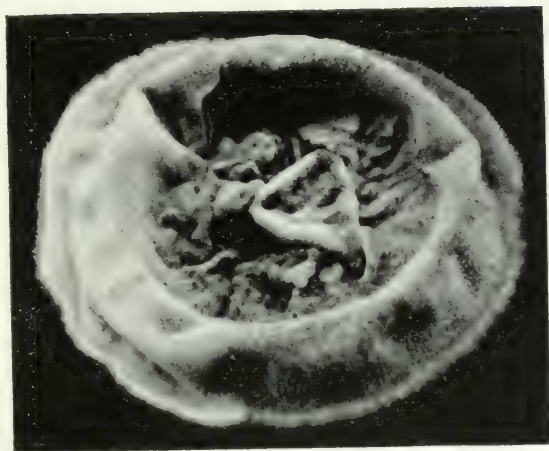
*Trichophyton rosaceum.*



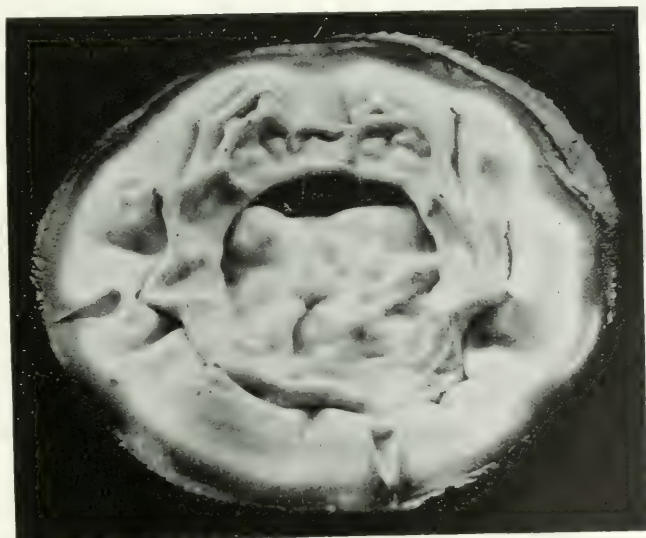
*Trichophyton crateriforme flavum.*



PLATE V.



*Trichophyton crateriforme flavum.*



Pleomorphic form of *trichophyton crateriforme flavum*.





PLATE VI.



Fungus (unknown variety) in finger-nail.



Fungus from finger-nail (variety unknown.) Grown for six weeks on Sabouraud's medium.



of them showed a pure culture of the fungus, but the majority contained also staphylococci, various yeasts, and penicillium glaucum, but by early subculture the fungus was easily isolated. In 5 of the cases trichophyton crateriforme flavum (primrose coloured) was obtained. These cultures are the same as that described by Colcott Fox in cases of ringworm of the body and scalp in London. This culture begins as a white downy growth, which very soon shows a central depression and the characteristic sulphur yellow colour. The central depression enlarges till a typical crater is formed. In some there are radiating depressions running outwards from the crater in the centre, in others these are not marked. The surface of the culture looks powdery, and in old cultures the centre crater area becomes brownish in colour and cracked. If these cultures are kept for some time a change takes place. There appears a whitish growth, which gradually spreads over the yellow culture and obscures it. This is the pleomorphic change which occurs in all old ringworm cultures which are grown on media containing sugar, such as maltose. Subcultures from this altered culture give very beautiful whitish-yellow growths which are distinctly crateriform.

The cultures from other two of my cases correspond to the trichophyton rosaceum, which is the large-spored fungus found on birds. The young cultures are fluffy and white, but soon show a delicate pink colour, and in some of the growths a yellowish tinge also in the centre. They are raised in the centre and have a few radiating depressions. These cultures also rapidly tend to show a pure white pleomorphic growth.

From another case peculiar cultures were obtained. At first they were contaminated by staphylococcus citreus. They were repeatedly subcultured and a growth obtained which had a pink tinge in places. On making subculture from the white and pink parts two distinct cultures were obtained. Unfortunately the growth of these cultures was not watched very closely, and I cannot say definitely whether the culture was originally white all over or whether there was a mixture of pink and white from the first. The white culture corresponds somewhat to the trichophyton accuminatum in its appearances, but is smoother on its surface. Until I have watched its growth by further subculture I am not prepared to say whether it is the trichophyton accuminatum or a pleomorphic form of the pink culture.

So far as I can find from the literature, Sabouraud and Favera are the only two observers who have previously investigated the

kinds of cultures obtained in ringworm of the nails. Sabouraud found trichophyton *accuminatum* and trichophyton *violaceum*; Favera obtained trichophyton *violaceum* and trichophyton *rosaceum*. To these must now be added the trichophyton *crateriforme flavum* found in my cases.

*Treatment.*—The treatment in these cases was difficult. Many of them were only seen once, so that I do not know whether the treatment recommended was ever carried out or not. All methods of treatment have for their object the softening and mechanical removal of as much of the diseased nail as possible and the application of some continuous antiseptic dressing.

The easiest method is to keep the nail covered with an india-rubber finger-stall after applying ung. hydrarg. ammoniat. night and morning. Of course the softened nail must be scraped away every day. One of the cases was cured by this method in 3 months, but in the majority of cases that method is quite ineffectual. A better method is Harrison's, *i.e.* in addition to the regular daily scraping a solution of pot. iodid., ʒj. in liq. potassæ, and aq. destill., āā ʒss., is applied for half an hour on a piece of cotton-wool. It is then removed, and for the rest of the 24 hours a solution of hydrarg. perchlor., grs. iv. in spir. vini, and aq. destill., āā ʒss., is applied on lint and the finger covered with an india-rubber finger-stall. These applications are repeated daily till the nail becomes black and so soft that it can be removed. In one case a cure was effected by the above method in 2 months. The reason for the failure in the other cases in which it was tried was that the patients stopped the applications as soon as the nails became the least painful. To get a good result the patient must be seen frequently, and the nails scraped by the doctor himself.

A new method which has given encouraging results is one devised by Dr. Norman Walker. He applies Fehling's test solution on lint to the nail, covers it with a finger-stall, and leaves it on for a day or two. At the end of that time the whole nail is so soft and pulpy that it can easily be removed by forceps. After the nail is removed a solution of copper sulphate, grs. 10 in water ʒj., is used as a continuous dressing. With this method good results were obtained in some of the cases; but whatever method is used long and painstaking treatment is essential for a successful result. When the disease is cured the nail grows in again without any deformity.

*Favus Cases.*—I have only seen 2 cases of favus of the nails. These were both in children with favus of the scalp. The appear-



ance of the nails is very similar to that of tinea, but the nails are yellower in colour. A mass of fungus also tends to accumulate like a scutulum underneath the nail and raise it up. The diagnosis is made by finding the fungus microscopically, and the treatment the same as in ringworm.

The other fungus infection which I wish to mention occurred in a girl aged 22, in whom 3 nails had been diseased for 10 years. The nails were greenish-yellow in colour and splintering off. There was also some heaping up of the nail at places. Scrapings from the nails showed that fungus was present, but it differed altogether from the fungus seen in the ringworm and favus cases. The mycelium was very fine, and in long slightly branched threads. The spores were arranged in bunches, and were round or pear-shaped. Cultures gave a fluffy greyish-white growth. This culture is certainly not a ringworm or favus, but without further observation I am not prepared to say to what class of fungus this one belongs. The nails were removed in this case after being softened by caustic potash, but some weeks later the new growing nail was still found to be infected with the fungus.

Towards the expenses of this research a grant was made by the British Medical Association.

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ERYTHRÆMIA: WITH NOTES ON TWO CASES.<sup>1</sup>

By H. L. WATSON-WEMYSS, M.D.

POLYCYTHÆMIA, *i.e.* an increase in the number of erythrocytes in the circulating blood, may be merely a transient phenomenon, and is frequently seen in cases in which, from any cause, there is excessive loss of fluid from the body. This constitutes "relative polycythæmia."

On the other hand the polycythæmia may be permanent, in which case it is designated as "absolute polycythæmia."

As was first suggested by Türk,<sup>1</sup> Hirschfeld,<sup>2</sup> and Osler,<sup>3</sup> absolute polycythæmia may be divided into two classes on analogy with the terms "leucocytosis" and "leukæmia"—1. Erythrocytosis; 2. Erythræmia.

## 1. ERYTHROCYTOSIS.

Erythrocytosis implies an absolute polycythæmia, which is the result of a vital reaction on the part of the organism to compensate for some difficulty in the oxygenation of the blood and tissues of the body. It is most typically seen in the subjects of congenital heart disease (Weber,<sup>4</sup> Gibson<sup>5</sup>) and in those suffering from other chronic cardiac and pulmonary complaints. It is also met with in persons residing at high altitudes; in these cases the polycythæmia is the expression of an effort on the part of Nature to compensate for the diminished oxygen-tension of the inspired air (Sellier,<sup>6</sup> Weber).<sup>4</sup> Further, erythrocytosis may be toxic in origin, the destruction of the red blood corpuscles by the poison being followed by great erythroblastic activity in the bone-marrow. In a case of acute phosphorus poisoning Taussig<sup>7</sup> counted 8,500,000 red cells per cubic millimetre. Stengel and White<sup>8</sup> record polycythæmia in a case of chronic acetanilide poisoning, and a similar condition was found by Fells<sup>9</sup> in a case of chronic sulphonal poisoning. In erythræmia, on the other hand, as Parkes Weber<sup>4</sup> expresses it, "the excessive erythropoiesis of which the polycythæmia is the expression appears to be the primary disorder." Both erythrocytosis and erythræmia are myelogenous in origin; that is to say, the absolute polycyth-

<sup>1</sup> Part of thesis submitted for the degree of M.D. of the University of Edinburgh.

emia, which is a feature common to both, is due to excessive activity of the bone-marrow. There exists, however, this important difference that, while in erythrocytosis the cause of this erythroblastic activity is known and the necessity for it fully appreciated, in erythremia no cause has yet been assigned. There are few observations in the literature regarding the condition of the bone-marrow in erythrocytosis, but in two cases of congenital heart disease with polycythemia, that is to say, cases of erythrocytosis, Weil<sup>10</sup> found evidence of abnormal erythroblastic activity, the bone-marrow having undergone red transformation and the normal fatty tissue having almost entirely disappeared. In another case of chronic cyanosis without polycythemia, Mackey<sup>11</sup> found the bone-marrow normal.

## 2. ERYTHREMIA.

*Definition.*—A morbid condition characterised by an absolute polycythemia due to excessive activity of the bone-marrow of unknown origin, by other well-marked changes in the blood, by cyanosis, and usually by enlargement of the spleen.

*Synonyms.*—Vaquez's disease, Osler's disease, splenomegalic polycythemia, myelopathic polycythemia, cryptogenetic polycythemia (Cabot<sup>12</sup>).

The disease was first described by Vaquez<sup>13</sup> in the year 1892, and his original papers are of great interest, but it appears that the condition was hardly recognised as a distinct clinical entity until the appearance of a paper by Saundby and Russell<sup>14</sup> in 1902 and of two communications by Osler<sup>3</sup> in 1903 and 1904.

There is reason to suppose that the condition may not be so uncommon as was at one time believed. The papers of Parkes Weber<sup>1</sup> are by far the most important and complete produced in this country on the subject, while those of Osler<sup>3</sup> and Anders<sup>15</sup> in America, and of Weintraud,<sup>16</sup> Senator,<sup>17</sup> Rosengart,<sup>18</sup> and Lommel<sup>19</sup> on the Continent, must be especially referred to.

*Clinical Characteristics of Erythremia.*—The condition is characterised typically by an absolute polycythemia, cyanosis, and splenomegaly. It is met with usually between the ages of 35 and 60, but cases have been recorded below the age of 30 (Anders,<sup>15</sup> Collins<sup>20</sup>). It appears to affect the male with slightly greater frequency than the female.

Clinically, cases of erythremia may be subdivided into the following groups:—



(a) Congenital erythraemia and erythraemia commencing in early life (Ambard and Fiessinger,<sup>21</sup> Hann<sup>22</sup>).

(b) Cases in which the blood-pressure is high; the "polycythamia hypertonica" of Geisböck.<sup>23</sup>

(c) Cases in which the blood-pressure is not raised.

(d) Cases in which there is marked splenomegaly.

(e) Cases in which there is no splenomegaly (Herringham,<sup>24</sup> Pfeiffer<sup>25</sup>).

*Subjective Symptoms.*—The subjective symptoms associated with the condition are usually well marked. It may be that the patient first seeks advice on account of an abdominal swelling or pain in the left lumbar region. Other common complaints are headache, vertigo, thirst, vomiting and constipation, which are present in the majority of cases, while less frequently there is lassitude, erythromelalgia-like symptoms (Türk<sup>1</sup>) and hæmorrhages, such as epistaxis (Zimlick<sup>26</sup>), bleeding from the gums (Cabot<sup>12</sup>), hæmatemesis (Hutchison and Miller<sup>27</sup>), hæmoptysis (Cautley<sup>28</sup>), hæmaturia (Vaquez,<sup>13</sup> Breuer<sup>29</sup>), and menorrhagia (Umney<sup>30</sup>). On examination the patient may be deeply cyanosed, but true cyanosis may be entirely absent, and the patient may simply present a florid appearance, with great dilatation and engorgement of the superficial vessels.

*Physical Examination.*—The physical examination of the chest is usually negative. The left ventricle may show a slight degree of hypertrophy, but this is rarely extreme. The blood-pressure may be considerably increased (polycythamia hypertonica), and the vessels may be thickened and tortuous. As will be mentioned later, the viscosity of the blood in erythraemia is always greatly increased, and on this account the blood-pressure always tends to rise, but great increase is usually avoided by compensatory dilatation of the vessels.

Examination of the abdomen reveals in the great majority of cases a considerable degree of splenic enlargement. The organ can usually be easily felt as a firm tumour extending downwards and forwards towards the umbilicus. The liver may be and often is slightly enlarged. The urine very frequently reveals a trace of albumen—a large quantity is recorded by Purves Stewart<sup>31</sup>—and hyaline and granular casts are sometimes found (Cabot<sup>12</sup>). An increase in the quantity of iron excreted can usually be demonstrated, and the urinary pigments may be present in excess (Ronaldson<sup>32</sup>).

Regarding the integumentary system, the extremities, especi-

ally the hands, may show very marked blueness, which is aggravated by cold. Attention has been drawn to a white line, the opposite of *tâche cérébrale*, which can sometimes be produced by cutaneous irritation. French writers have attributed this to suprarenal inadequacy. Solis-Cohen<sup>33</sup> calls it one of the phenomena of vasomotor ataxia. True dermatographism may be present (Saundby<sup>34</sup>).

The examination of the nervous system is usually negative. The engorgement of the vessels with dark blood is very well seen by examination of the fundus oculi. Double optic neuritis is recorded by Purves Stewart.<sup>31</sup>

### THE BLOOD IN ERYTHREMIA.

The chief interest of the condition centres in the examination of the blood.

The most important features of the blood in erythremia are:—

(a) An absolute and persistent polycythæmia.

(b) A considerable leucocytosis, with both a relative and absolute increase in the polynuclear and eosinophilic cells.

(c) A great increase in the blood viscosity.

(d) A great increase in the total volume of the blood.

*The Polycythæmia in Erythremia.*—The number of red blood corpuscles per cubic millimetre of the circulating blood varies considerably in different cases of erythremia and also from time to time in the same patient. Most frequently the count ranges from 8,000,000 to 9,000,000, but 10,000,000 is quite a common figure (Hall<sup>35</sup>). Unney<sup>36</sup> records 11,500,000 and Cabot<sup>12</sup> 12,000,000. The highest count recorded is 13,600,000 by Koester.<sup>36</sup> Dr. G. Mann<sup>37</sup> has computed that there is not room for more than 13.9 million corpuscles in a cubic millimetre of blood. As regards the size of the individual corpuscles, it is usually about normal, as Vaquez<sup>13</sup> was the first to point out, in contrast with the size of the corpuscles in erythrocytosis, in which he found an increase in the diameter of the cells. Nucleated red cells may be seen (Osler<sup>3</sup>), and poikilocytosis and polychromatophilia have been observed (Begg and Bullmore<sup>38</sup>).

*The Leucocytes in Erythremia.*—In the great majority of cases a marked leucocytosis is found, the highest counts recorded being 91,000 by Cautley<sup>28</sup> and 54,000 by Weintraud,<sup>16</sup> while 20,000 is quite a common figure. A leucopenia with a relative increase in the polynuclear cells is recorded by Osler.<sup>3</sup>

A marked feature of the white cells is the great preponderance of the polynuclear cells which is almost constantly found—from 75 per cent. to 90 per cent. of the white cells are usually of this type. This increase takes place at the expense of the large and small mononuclear forms, which are relatively much reduced in number. An exception to this usual finding is the case mentioned by McQuitty,<sup>39</sup> in which only 46 per cent. of the total number of leucocytes were polymorphs while no less than 27 per cent. were of the large mononuclear type.

The eosinophiles are increased, both relatively and absolutely, and form from 3 per cent. to 6 per cent. of the total number. Myelocytes may be found (Russell<sup>40</sup>), but are usually very scanty. In this connection, however, the case recorded by Blumenthal<sup>41</sup> may be mentioned. In this remarkable case, the only one of its kind recorded, there were 11,500,000 red corpuscles and 16,300 leucocytes per cubic millimetre, and no less than 36 per cent. of the latter were myelocytes. This case, therefore, seems to supply a missing link between erythraemia and myelogenous leukaemia.

*The Viscosity of the Blood in Erythraemia.*—In erythraemia the viscosity of the blood is always greatly increased; it may be said that the greater the degree of polycythaemia the higher the viscosity value. All who have investigated the subject are agreed that the degree of viscosity of any given specimen of blood is chiefly dependent on the number of corpuscles per cubic millimetre (Denning and Watson<sup>42</sup>). Other factors, no doubt, play a part in determining the viscosity value, but these are of altogether secondary importance. In the two cases about to be mentioned the viscosity varied from twice to three times the normal.

*The Total Volume of the Blood in Erythraemia.*—This has been shown in several cases to be greatly in excess of the normal, and indeed this is not surprising when one remembers the extreme engorgement of all the vessels and organs which is found after death.

Parkes Weber<sup>4</sup> records a case in which the total volume of the blood was estimated by the CO method of Haldane and Lorrain Smith, and was found to be greatly increased. Further evidence has been adduced by Hutchison.<sup>43</sup> It is said that the total volume may be even three or four times the normal.

#### OTHER FEATURES OF THE BLOOD IN ERYTHRAEMIA.

*Hæmoglobin.*—The hæmoglobin is usually increased, but never proportionately to the increase in the number of red corpuscles,

so that the colour index is always less than 1. It may, however, reach such a high figure as 160 or 170 per cent.; it usually varies between 110 and 140 per cent. The extraordinary figure of 240 per cent. is recorded by Koester;<sup>36</sup> but much doubt exists as to the accuracy of this estimate.

*Coagulability of the Blood.*—Coagulation does not appear to be affected in any characteristic way in erythræmia. It is sometimes more rapid and sometimes slower than normal. In the case recorded by Pethybridge<sup>44</sup> it was unusually slow.

*The specific gravity* of the blood as a whole is increased, while that of the blood-serum is usually rather below normal.

*The amount of iron* in the blood is increased.

*Resistance to hæmolytic agents* seems to be about normal. There is no evidence that increased durability of the red cells is the cause of the polycythæmia.

CASE I.—*A Case of Polycythæmia with Splenomegaly.*—J. G., a miner by occupation, was admitted to the Royal Infirmary of Edinburgh in March 1904 under the care of Dr. G. A. Gibson. He gave the following history:—

He is 52 years of age, is married, and has five children. His father died of bronchitis and his mother of heart disease. He has four brothers and one sister alive and in good health; one sister died of phthisis in early adult life. His surroundings at home and at work are satisfactory. He has been strictly moderate in the consumption of tobacco and alcohol.

Apart from the usual children's complaints the only illness he has had is right-sided pleurisy, of which he has had two attacks, when 35 and 46 years of age respectively. There is no luetic or malarial history. His present illness commenced in November 1903. He then noticed a swelling in the abdomen, and he was also troubled by pain in the abdomen, which used to come on about a quarter of an hour after food, and was accompanied by vomiting, eructations, and dizziness. As he was losing weight and feeling weak he was obliged to stop work. He stayed in hospital for a month at this time. The abdominal swelling was subjected to the X-rays, which improved his condition to a great extent. The pain ceased, and the abdominal tumour became no longer palpable. He was admitted a second time, in August 1904, as the pain had returned. The abdominal tumour was now about double the size it was on the previous occasion. He was again treated by the X-rays, and after ten exposures felt much better, while the tumour



was also much smaller. He remained in hospital for six weeks on this occasion, and then left, as there was unfortunately some burning of the skin from the X-rays.

The patient again sought admission in October 1904, when his condition was as follows:—

Weight	.	.	.	8 st. 6 lbs.
Height	.	.	.	5 ft. 4 $\frac{3}{4}$ ins.

*General facts.*—The patient is not emaciated. There is no cyanosis, but he has a slightly ruddy complexion; otherwise he looks healthy.

*Alimentary System.*—His teeth are very bad; he only has eight left. His tongue is distinctly redder than normal, with a slight central fur. His appetite is now excellent and he takes ordinary food. He has no pain after meals and no vomiting. The bowels are regular.

On palpation of the abdomen a firm painless tumour is felt in the epigastric and left hypochondriac regions. It is freely movable and is not adherent to the parietes. On percussion the tumour is absolutely dull, and this dulness merges into that of the spleen. The liver is not enlarged; the stomach is not dilated; the heart and lungs show no departure from the normal.

The X-rays were again employed with great benefit, the tumour being much reduced in size. The patient left hospital feeling perfectly well and resumed his work. He remained in good health till the middle of November 1905, when he again began to experience pain in the abdomen, and noticed a swelling on his left side. He was again admitted to the Royal Infirmary, when it was noted that he had a distinctly florid complexion. His teeth were practically all gone, his tongue was clean, and he had no thirst or loss of appetite. He stated that he was a little troubled by constipation. He complained of pain in the epigastric region of the abdomen, which had no special connection with the ingestion of food, but which was worst at night and passed round the left side to the back. There was, on examination, a noticeable fulness on the left side of the abdomen, and on palpation a hard well-defined mass was easily felt extending downwards and forwards from under the left costal margin and reaching almost to the umbilicus. It had a distinct edge, and a notch was felt low down on its inner margin. This mass was absolutely dull, and its dulness merged into that of the spleen. The liver

was not enlarged. The stomach was not dilated. A test meal yielded the following results:—

*Reaction* neutral.

No free hydrochloric acid.

Lactic and butyric acids present.

Total acidity = .014.

*Urine*, acid, clear : specific gravity = 1021 ; deposit of mucus.

Examination of the blood gave the following figures:—

Erythrocytes . . . .	4,590,000
Hæmoglobin . . . .	87 %
Leucocytes . . . .	10,300

*Differential count*—

Polynuclears . . . .	= 69.5 %
Lymphocytes . . . .	= 22.5 %
Large mononuclears . .	= 4 %
Eosinophiles . . . .	= 4 %

X-ray treatment was again employed, and the patient was doing well under it when he elected to leave hospital.

He remained in good health till May 1908, when the old swelling and pain in the left side returned, and he was admitted to the Infirmary in the month of June.

The pain of which he complained was worst at night, and on taking a long breath. It was relieved by lying on the right side. On examination the patient was now seen to be thin in the face, the cheek-bones standing out prominently. He was extremely florid in countenance but hardly cyanosed. The lips, gums, tongue, and fauces were intensely coloured. He complained of no headache, no vomiting, and no loss of appetite. The abdominal swelling was easily recognised as the enlarged spleen, which reached forwards to the umbilicus and extended about 2 inches below that level. A notch was very easily felt. The spleen was hard and exquisitely tender to the touch; the liver was slightly enlarged; the heart was slightly enlarged; the apex beat was in the fifth left interspace, just external to the left mammary line; the heart sounds were closed and pure; the vessels were moderately thickened; the systolic pressure was 130 mm. Hg. Examination of the blood now revealed a very different picture. The following counts were made while he remained in hospital:—



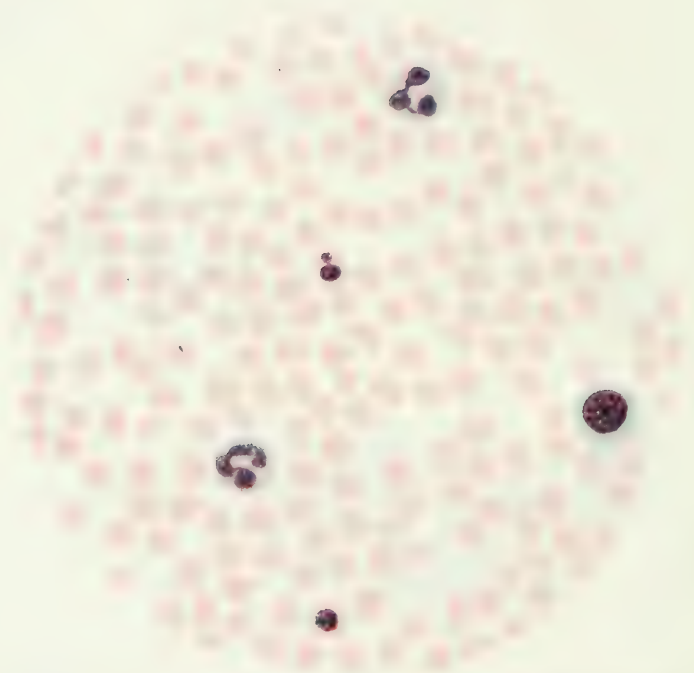


FIG. 6. Blood film from the same case, showing two normoblasts in the field, and two polymorphs. Normoblasts were numerous in this film. The red cells vary considerably in size and shape, but there is no true poikilocytosis. Leishman's stain.  $\times 500$  diameters.





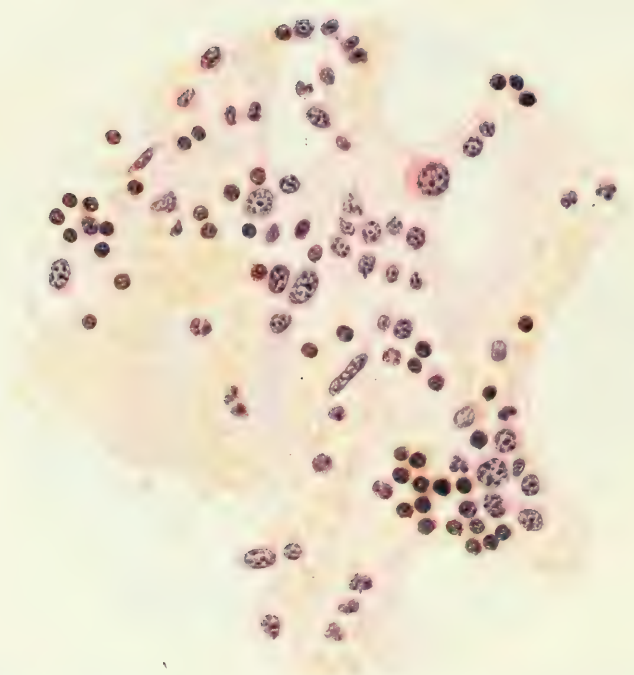


Fig. A. Bone-marrow.  $\times 500$  diameters. Leishman's stain. Shows the almost complete absence of fat cells, large numbers of nucleated red corpuscles, several myelocytes which may be recognised by their large and less distinct outline and polymorphs.



Erythrocytes . . . . .	8,870,000	8,180,000	9,360,000	10,870,000	8,840,000
Hæmoglobin . . . . .	110 %	106	106	106	110
Leucocytes . . . . .	17,600	26,200	27,400	16,600	30,600
<i>Differential Count</i>					
Polynuclears . . . . .	77	81	79	80 %	77
Lymphocytes . . . . .	9	13	11	8 %	19
Large mononuclears . . . . .	9	4	2	8	2
Eosinophiles . . . . .	1	1	1	4 %	2 %
Mast Cells . . . . .	1	1	1	..	...

The patient improved greatly under X-rays as far as his subjective symptoms were concerned. The pain disappeared completely, but very little alteration took place on this occasion in the size of the spleen, and the degree of polycythæmia was not affected. After leaving hospital the patient reported himself at intervals, and after six months had elapsed attended the X-rays department as an out-patient, undergoing another course of treatment. The spleen was exposed to the X-rays three times a week for ten minutes on each occasion. This treatment was continued for a month.

The following observations were made at this time:—

Date . . . . .	13/2/09	22/2/09	27/2/09	6/3/09	13/3/09
Erythrocytes . . . . .	13,250,000	10,850,000	12,450,000	10,000,000	10,050,000
Hæmoglobin . . . . .	130 %	120	120	120 %	130 %
Leucocytes . . . . .	28,400	21,600	19,800	24,200	20,000
<i>Differential Count—</i>					
Polynuclears . . . . .	74	80 %	82 %	76	83 %
Lymphocytes . . . . .	17 %	12 %	13	15 %	10 %
Large mononuclears . . . . .	5	3	1 %	6	4
Eosinophiles . . . . .	3	3	1	2 %	3
Mast Cells . . . . .	1 %	2	...	1	...

The accompanying drawings of bone-marrow taken from this case are of peculiar interest, since there is no other case mentioned in the literature in which the bone-marrow in a case of erythraemia was examined during life. During the patient's stay in hospital in the summer of 1908 the tibia was explored and some bone-marrow was removed. Sections were made, the accompanying drawings showing the appearance they presented.

CASE II.—*A Case of Erythraemia without Splenomegaly.*—A. B., a miner aged 55, was admitted to the Royal Infirmary of Edinburgh under the care of Dr. G. A. Gibson on the 27th February 1909.

He complained of giddiness, pain in the head, especially on the right side, and vomiting. His family history was unimportant. His home was comfortable, and he had always had a sufficiency of good plain food. From the nature of his occupation he had had his share of hard work. He had always been moderate in the use of tobacco and alcohol. He had typhoid fever when a young man, otherwise he had been very healthy all his life. There was no venereal history. The symptoms of which he complained on admission first troubled him four months previously, when he had an attack of giddiness, lasting for about half a minute. This was accompanied by severe pain in the head, especially in the right frontal region. He also complained of dimness of vision in the right eye, a symptom noted by M'Keen.<sup>45</sup> He had vomited on six different occasions, this vomiting having no relation to the taking of food. He said that he had been losing weight for two years.

*General Facts.*—On admission the patient was seen to be a thin man with an exceedingly florid countenance, but he could hardly be described as cyanosed, otherwise his appearance was healthy. His lips and tongue were very highly coloured, the conjunctivæ were injected, and the superficial venules much engorged and dilated.

*The nervous system* showed no departure from the normal. By ophthalmoscopic examination the fundus oculi was seen to be much darker in colour than in health, and the vessels were greatly engorged with very dark blood. There was no trace of optic neuritis.

*Circulatory System.*—The heart was slightly enlarged; the apex beat was in the fifth left interspace in the left mammary line; the heart sounds were closed and pure; the vessels were thickened and tortuous; the systolic pressure was 130 mm. Hg.; the lungs showed no abnormality.

*Alimentary System.*—The teeth were bad; the lips, gums, tongue, and fauces were intensely coloured. He complained of considerable thirst and of vomiting with no relation to the taking of food. He was troubled by very marked and obstinate constipation. The liver was not enlarged, extending from the fourth right interspace in the right mammary line to the costal margin. The stomach was not dilated.

*Urine.*—*Reaction* acid; *specific gravity* 1018; trace of albumen = .1 gr. per oz.; no casts; urea = 4 grs. per oz.

*Hæmopoietic System.*—The spleen was not enlarged.



Date . . . . .	13 09	13 09	6 3 09	8 3 09	11 3 09	13 3 09	17 3 09	21 3 09	29 3 09
Erythrocytes . . .	7,950,000	8,250,000	9,000,000	8,400,000	9,100,000	8,700,000	8,750,000	8,700,000	8,550,000
Hæmoglobin . . .	100	100	110 %	110	110	105	105	105	100 %
Leucocytes . . . .	15,600		13,800	12,400	10,200	9,200	11,000		14,800
<i>Per cent. Count</i>									
Polynuclears . . .	77	88	75	81 %		73	80 %	..	77 %
Lymphocytes . . .	17	7	18	11		15	12		11 %
Large mononuclears	2	3	..	6 %		6	2 %		5 %
Eosinophiles . . .	1	2	6	2		1	5		3 %
Fast Cells . . . .			1			2	1		4 %

### THEORIES OF ERYTHREMIA.

I. *That Erythremia is a Primary Myelopathy.*—This theory supposes that the polycythæmia is the result of a primary hyperplasia of the bone-marrow, affecting both the erythroblastic and the leucoblastic tissues.

Parkes Weber<sup>4</sup> is the most eminent advocate of this theory. He considers the following to be the order of development of the symptoms:—

(a) Increased erythroblastic activity, involving a great part but not necessarily all of the bone-marrow.

(b) Increased viscosity of the blood, due to the polycythæmia.

(c) Dilatation of the small vessels, partly to lessen resistance to the abnormally viscous blood and partly to make room for dilution of the blood.

(d) The plethora vera or polyhæmia is to be regarded as an attempt to compensate for the increased viscosity and the excessive percentage of the total volume of the blood occupied by the red blood corpuscles.

(e) The arterial hypertonia (when present) is to be looked upon as due to the greater strain thrown on the circulatory mechanism.

(f) Cyanosis due to inadequacy of the compensatory changes. This is merely in accordance with the well-established fact that deficient oxygenation is the constant factor in the production of cyanosis (Gibson<sup>5</sup>).

This conception of erythremia now receives most support. In this way all the phenomena which are met with clinically are the natural result of the increased activity of the bone-marrow. It can no longer be questioned that the polycythæmia is due to increased erythroblastic activity of the marrow. Apart from the

examination of the blood, which reveals an increased number of polynuclear leucocytes and sometimes myelocytes and nucleated red corpuscles, it has been abundantly proved by numerous post-mortem observations that in erythraemia the bone-marrow is in a state of great erythropoietic activity.

*The Histological Changes in the Bone-Marrow.*—The description given by Hirschfeld<sup>2</sup> of the bone-marrow changes in erythraemia is probably the best and the most complete.

Macroscopically the bone-marrow is of a bluish-red colour; the normal yellow colour is absent.

Microscopically Hirschfeld found in ordinary fresh preparations enormous numbers of non-nucleated red corpuscles, which dominated the whole picture. On the other hand, the number of normoblasts appeared to be only slightly greater than in normal bone-marrow. He observed many karyokinetic figures in the normoblasts. Regarding the leucocytes, all varieties were represented; thus both large and small mononuclear cells with a narrow rim of non-granular basophil cytoplasm were seen; neutrophilic and eosinophilic myelocytes, polynuclear cells, and mast cells were also present.

As far as the leucocytes were concerned the bone-marrow did not differ essentially from the normal.

The study of sections of the bone-marrow showed the changes better. The most striking feature was the enormous dilatation of the blood-vessels and blood-spaces, which were crowded with non-nucleated red blood corpuscles. The tissue lying between these vessels and blood spaces showed no trace of fat, and consisted in great part of white corpuscles and giant cells.

The number of nucleated red corpuscles in the sections was small in comparison with these other varieties.

The leucocytes could be differentiated into two groups:—

(a) Large clusters of cells of the small lymphocyte type. Many of these showed budding of the nuclei and karyokinetic figures. They are known as "Rieder's lymphocytes"—after the observer who first described them.

(b) Leucocytes lying together in large masses, some with eosinophilic some with neutrophilic granules, the nuclei being in most cases round, more seldom polymorph.

There was no sharp boundary line between these two groups of cells; they intermingled with each other.

The normoblasts in the sections lay for the most part round about the clusters of lymphocytes. Hirschfeld concludes by

saying that although the number of normoblasts per unit of space in the bone-marrow was not greater than normal, yet, when it is remembered that the marrow of all the long bones, which is normally composed of fat, was transformed into actively functioning marrow tissue, it must be agreed that the total number of nucleated red corpuscles produced by the bone-marrow was very greatly increased.

II. *Splenic Tuberculosis*.—It has been suggested that the condition is due to primary tuberculosis of the spleen. Rosengart<sup>45</sup> favoured this view, but only two cases (Moutard-Martin and Lefas,<sup>46</sup> Rendu and Vidal<sup>47</sup>) have been recorded in which, at autopsy, the spleen was found to be the seat of tubercular lesions.

Collet and Gallivardin<sup>48</sup> mention the case of a man in whom both liver and spleen were enlarged, and the spleen was found to be tubercular, but no count of the red corpuscles was made: and even though the patient presented a florid appearance, it cannot be assumed that polycythæmia was present. The leucocytes, moreover, were unaltered. Further, it has been proved beyond question that splenic tuberculosis is by no means necessarily accompanied by polycythæmia. In D. D. Stewart's case<sup>49</sup> the red blood corpuscles numbered only 3,800,000.

Again, in several instances, tuberculosis has been excluded by the tuberculin reaction.

It is generally agreed that, while splenic tuberculosis may occasionally give rise to clinically splenomegalic polycythæmia, this is quite exceptional.

III. *Diminished Destructibility of the Red Corpuscles*.—It has been supposed that the polycythæmia is due to increased resistance of the red blood corpuscles to hæmolysis, and a consequent increase in the life-duration of the cells; but in cases in which this has been investigated the resistance to hæmolysis has been found normal (Parkes Weber,<sup>4</sup> Saundby<sup>54</sup>) or slightly below normal (Vaquez and Laubry<sup>50</sup>).

On account of the enormous number of erythrocytes which are being set free from the bone-marrow, increased hæmolysis must and does occur, this being evidenced by an increased amount of iron in the urine.

IV. *Diminished Oxygen-Carrying Power of the Hæmoglobin*.—The idea that the polycythæmia is due to a diminished oxygen capacity of the hæmoglobin has been put forward most prominently by Bence,<sup>51</sup> but confirmatory evidence is entirely wanting. Moreover, in several cases of methæmoglobinæmia, in which the oxygen

capacity of the hæmoglobin is necessarily diminished, no polycythæmia has been observed.

V. *The Theory of Blood Stasis*.—This is the most important rival theory to that which regards erythræmia as a primary myelopathy.

There is no doubt that blood stasis, especially when resulting from chronic obstruction in the portal and splenic veins, may give rise to what is clinically splenomegalic polycythæmia. Lommel<sup>19</sup> holds that all cases of erythræmia are due to blood stasis. Anders<sup>15</sup> says that defective venous tonus plays an important part in the production of erythræmia. These observers therefore hold that the polycythæmia is secondary to the blood stasis. But polycythæmia will itself produce blood stasis, on account of the increased viscosity of the blood. In addition, it will lead to a tendency to thrombosis, which in its turn will further impede the circulation. Delayed circulation and congestion in the blood-vessels of the lungs and bronchi promote chronic catarrhal changes, which induce cyanosis and throw extra work upon the heart (Weber<sup>4</sup>).

The prevailing opinion is that the impeded circulation is secondary to the polycythæmia which is the result of a primary hyperplasia of the bone-marrow.

Saundby,<sup>34</sup> in supporting the theory of blood stasis, states his belief that the condition is a cerebro-spinal neurasthenia, causing vasomotor spasm, with engorgement of the capillaries and venous circulation, and congestion of the internal organs, especially the liver and spleen, with muscular weakness, loss of knee-jerks, and mental impairment shown by loss of memory, apathy, and drowsiness. He thinks that this vasomotor derangement is a neurosis, is part of a general neurasthenia, and is often caused by influenza.

In support of his theory he quotes Zuntz and Cohnstein,<sup>52</sup> who showed that section of the cord high up leads in a few minutes to a fall in the number of red blood corpuscles per cubic millimetre from five to three million. Stimulation, on the other hand, determines an afflux of cells, so that the capillaries of the skin are engorged and the cells are tightly packed together so as to cause stasis by arrest of the circulation.

As further proof of the influence of the vasomotor system in producing concentration of the blood, Saundby mentions the experiment described by Chéron,<sup>53</sup> which is as follows:—If 5 to 10 c.c. of 1 per cent. saline solution are injected into an anæmic or neurasthenic patient, a blood count having first been made, the hæmoglobin having been estimated, and the blood-pressure havin



been taken, two results are observed:—(1) A marked rise in the blood-pressure. (2) An increase, sometimes considerable, in the number of the red blood corpuscles, the degree of increase varying in different cases.

Chéron says that under the influence produced on the circulatory apparatus through the central nervous system by the stimulus of the hypodermic injection the vascular system contracts, its capacity is lessened, the fluid part of the blood, being subjected to strong pressure, escapes into the perivascular tissues, and the red blood corpuscles, now being bathed by a much smaller quantity of fluid, appear to be present in greater numbers.

This experiment has obviously no bearing on erythræmia, since it has been proved beyond question that in erythræmia the total blood volume is not diminished but greatly increased. In other words, we have to deal with an absolute and not a relative polycythæmia.

The loss of the knee-jerks mentioned by Saundby is by no means a constant finding in erythræmia; and even if it were, a condition in which the knee-jerks are definitely lost cannot surely be a pure neurosis.

Again, erythræmia ought certainly to be a much more common condition than it is, if influenza is a not infrequent etiological factor, when we consider the widespread incidence of the latter affection.

Another strong point against the theory of blood stasis is thus expressed by Weber<sup>4</sup>: "Although the presence of increased arterial blood-pressure is no sure sign of the absence of any blood stasis of cardiac or pulmonary origin, the fact that in some cases of polycythæmia with high blood-pressure the number of red corpuscles is almost as great in the arterial as in the venous blood forms a strong argument against blood stasis playing a large part in the causation of the polycythæmia in the cases in question."

In Case I. recorded here counts taken simultaneously from the dorsal artery and dorsal vein of the foot gave the following figures:—

Dorsal Artery—11,270,000.      Dorsal Vein—10,970,000.

#### THE CAUSE OF THE BONE-MARROW CHANGES.

Assuming now that the theory which regards erythræmia as a primary myelopathy is correct, it is necessary to inquire what may be the primary exciting factor which brings about these striking

changes in the bone-marrow. Three theories have been propounded with regard to this point:—

(a) Ribbert<sup>54</sup> believed that the affection of the bone-marrow was of the nature of a tumour formation, but no other instance of such a condition has been recorded.

(b) It may be a reversion to, or a persistence of, the foetal condition, in which the bone-marrow is red and actively engaged in producing red blood corpuscles. It seems probable that this view may adequately explain cases of congenital erythraemia and erythraemia commencing in early life.

(c) *The Toxin Theory*.—It has been supposed that a toxin circulating in the blood may act as the exciting factor in the production of the bone-marrow changes. In the immense majority of cases a circulating toxin gives rise to an anaemia, more or less profound, but it has been shown that if very minute doses of, *e.g.*, tuberculin are given to an animal, polycythaemia may result, because sufficient has been given to stimulate the reactive powers of the organism but not sufficient to overwhelm them.

The toxins of syphilis, malaria, and tubercle have from time to time been mentioned as possible causal factors in the production of erythraemia, and while occasionally one or other of these may have some relationship to the condition, it is out of the question that any one toxin is the constant exciting factor at work.

Regarding other possible sources from which a condition of toxæmia might take origin, the large proportion of the cases mentioned in the literature in which there were signs of oral sepsis and gastric disturbance is very striking.

Again, in the case recorded by Kikuchi<sup>55</sup> bronchiectasis was present, and Kikuchi thought that this might be acting on the bone-marrow in the same way as it may do on the bones, producing hypertrophic pulmonary osteoarthropathy.

Middle ear disease has been recorded in one case (Ascoli<sup>56</sup>). It is seen, therefore, that conditions which might produce such a toxæmia as this theory premises are very frequently present in erythraemia, and it seems probable that these toxins acting on bone-marrow which is perhaps in some way predisposed may light up the erythroblastic activity which is the starting-point of the condition.

#### THE CAUSE OF THE SPLENIC ENLARGEMENT.

*Theories*.—1. It may occasionally be due to primary disease of the spleen, *e.g.* tuberculosis.

II. It may be due to excessive functional activity; that is to say, the organ attempts to compensate for the increased production of red cells by increased destruction. Increased haemolysis must necessarily occur in erythraemia, and Hirschfeld<sup>2</sup> in at least one instance found evidence of very active phagocytosis of the red blood corpuscles in the spleen.

III. According to Parkes Weber,<sup>4</sup> the chief cause of the splenic enlargement is engorgement with blood due to the polyhaemia, the organ acting as a reservoir; to a lesser extent it is due to an increase in the splenic pulp.

A consideration of Case I. recorded here seems to throw some light on the subject of the splenic enlargement. One of the most striking features of the case was the existence of marked splenomegaly before there was any polycythaemia. This fact is strongly opposed to the view that the enlargement is chiefly due to the polyhaemia, for without polycythaemia and the increased blood viscosity which is consequent upon it there is no need for the dilution of the blood which causes the polyhaemia.

If, on the other hand, it is supposed that the splenic enlargement is due to the increased activity of the organ in destroying the red blood corpuscles, a possible explanation presents itself, for it is possible that the spleen may enlarge as a consequence of the increased output of red blood corpuscles from the bone-marrow, in order to bring about greater destruction of these corpuscles and to keep their number per cubic millimetre at a normal figure, thus obviating all the secondary evils which will infallibly result if polycythaemia occurs.

It may then be supposed that a time will come when the spleen is no longer capable of dealing with this extra strain which is put upon it, and then polycythaemia will occur. The resulting increase in the viscosity will be followed by polyhaemia, which will further augment the splenic enlargement.

If such a supposition be entertained regarding polycythaemia with splenomegaly, the absence of splenomegaly in some few cases demands explanation.

The most probable explanation seems to be simply that the organ fails to respond to the extra demand which is made on it. Such a view regarding the absence of splenomegaly in some cases of erythraemia finds many analogies in medicine: *e.g.* the heart may fail to respond by hypertrophy to the extra demand put upon it by a valvular lesion.

Herringham,<sup>24</sup> in describing a case of this nature, suggests

that the polycythæmia is due to diminished oxygen capacity of the hæmoglobin, brought about by a reducing substance in the blood, which reduces oxyhæmoglobin but does not produce methæmoglobinaemia or sulph-hæmoglobinaemia—conditions met with in enterogenous cyanosis (Cheinisse<sup>57</sup>).

If this view of the polycythæmia were accepted, it might be that the spleen does not attempt to bring about greater destruction of the red blood corpuscles and therefore does not enlarge, because the polycythæmia is necessary for the oxygenation of the tissues of the body, the hæmoglobin being robbed to a certain extent of its oxygen-carrying power.

In the same way it might be supposed that in cases of erythrocytosis, *e.g.* congenital heart disease, although polycythæmia may be marked, splenic enlargement is absent, because the organism has an actual need for an increased number of red blood corpuscles in order to keep up the vitality of the tissues.

#### DIAGNOSIS OF ERYTHREMIA.

In order to establish a diagnosis of erythremia two things are necessary: in the first place there must be an absolute polycythæmia; and secondly, there must be no condition which could possibly give rise to the development of an erythrocytosis. The first of these is easily established by the examination of the blood and by the exclusion of any condition which might produce a relative polycythæmia. The second, however, may be very difficult or even impossible to prove; and it thus comes about that cases are considered to be cases of erythremia when no obvious cause for the development of erythrocytosis can be clinically recognised. That this is not always satisfactory is shown by the fact that in two cases, which during life were considered to be cases of erythremia, the post-mortem examination revealed a condition of chronic obstruction in the splenic vein which had given rise to blood stasis, and which was quite sufficient to account for the compensatory activity of the bone-marrow (Lommel,<sup>19</sup> van der Weyde and van Ijzeren<sup>58</sup>).

If the symptoms and physical signs are alone considered, and a blood examination is omitted, errors of diagnosis must frequently occur. This shows the extreme importance of a routine blood examination in any case where the diagnosis is at all doubtful.

In Case I. the gastric symptoms and the absence of free hydrochloric acid in the stomach contents, together with a palpable epigastric tumour, led to the suspicion of a gastric neoplasm. The



blood, however, instead of revealing a condition of anæmia, showed first a normal blood count and later a polycythæmia.

In Case II. the symptoms exactly resembled those of a cerebral tumour ; this, indeed, seemed the probable diagnosis, until the blood examination and the use of the ophthalmoscope revealed the true condition.

Erythremia may be suspected from the florid or cyanosed appearance of the patient, and from the evident splenic enlargement which will usually be easily detected in examination of the abdomen. These conditions should at once lead to an examination of the blood, when the characteristic features of erythremia will be found. The degree of polycythæmia and of leucocytosis and the increased percentage of polynuclear cells are not of any special value in diagnosis, as they merely indicate the extent of the implication of the erythroblastic and leucoblastic elements of the bone-marrow.

The subjective symptoms, thirst, vomiting, and constipation, must be looked upon as of some value from the point of view of diagnosis, or at least of differential diagnosis between erythrocytosis and erythremia ; for if we accept the prevailing theory of erythremia regarding a toxæmia which frequently finds its origin in the alimentary canal, these symptoms, if present in any particular case, point to the possibility of such a toxæmia.

It may be contended that the unhealthy state of the digestive tract, of which these symptoms are the expression, is not so much the cause as the effect of the polycythæmia ; for it might be supposed that the extreme stagnation of the blood, which necessarily follows a high degree of polycythæmia, would disturb the functional activity of the stomach and intestines, and lead to a condition of atony.

But such a view is hardly tenable when we consider that treatment solely directed to the alimentary tract will cause an arrest of these symptoms, an arrest which apparently may be permanent.

#### PROGNOSIS IN ERYTHREMIA.

The prognosis is ultimately bad. Recovery is unknown, but in many cases the condition remains stationary and non-progressive for some years. Death may occur from cerebral hæmorrhage (Zimlick<sup>26</sup>), while in two or three recorded cases (Saundby<sup>34</sup>) the patients have suddenly become drowsy and apathetic, have sunk into coma, and died. In other cases death has occurred from

tuberculosis or other intercurrent affections. The case recorded by Umney<sup>30</sup> is of special interest. In this case the erythremic condition was complicated by chorea and extensive thrombosis in the large veins returning from each of the four limbs. Death was apparently due to extension of the thrombotic process to the inferior vena cava and the right side of the heart. The case raises interesting questions regarding the pathology of chorea.

### TREATMENT OF ERYTHRÆMIA.

Treatment is unsatisfactory, as indeed must be the case when so little is known of the essential nature of the condition. Still, much may be achieved by regulation of the daily life of the patient and careful attention to diet. Moderate and regular outdoor exercise must be insisted upon, as there is no doubt that a sedentary mode of life aggravates the condition.

Excessive use of tea and coffee should be avoided, and red meat should be sparingly taken.

The constipation, which is so frequently a marked and troublesome feature of the condition, must be met by appropriate drugs when other measures fail to give relief.

While other treatment is being carried out the severe headaches may be temporarily relieved by such drugs as butyl-chloral and gelsemium, which were used with much benefit in Case II.

*Free venesection* has in several instances proved beneficial, and has at least temporarily relieved the most distressing symptoms (Cautley<sup>28</sup>). This benefit has been most marked in cases accompanied by a high blood-pressure—the *polycythæmia hypertonica* of Geisböck. In cases with a low blood-pressure little benefit has been derived.

*Splenectomy*.—Complete extirpation of the spleen has been tried but has given most unsatisfactory results and is certainly not to be recommended. This operation has, in patients who have been subjected to it, frequently brought about a rapidly fatal termination (Comminotti<sup>59</sup>). The possibility of the development of an even greater degree of polycythæmia after splenectomy must also be kept in mind (Schüpfer<sup>60</sup>).

*Treatment by X-Rays*.—This method of treatment has usually been considered to be uncertain and, on the whole, unsatisfactory. There are very few cases recorded in which any decided benefit accrued from the treatment.

In Case I. recorded here, however, one of the most striking points in connection with the case was the remarkable improve-

ment, both in the subjective symptoms and in the size of the spleen, which followed the exposure to the X-rays in the early stages of the disease.

The polycythæmia, it is true, did not appear to be affected to any extent, but the rapid diminution in the size of the spleen and the equally rapid disappearance of all the subjective symptoms was most striking.

In the later stages, when the patient had not been under observation for nearly three years, when the spleen had reached an enormous size and the polycythæmia had attained a very high figure, the rays did not seem to have the same effect on the spleen, but the subjective symptoms again underwent marked amelioration.

It would appear, therefore, that the X-rays form a most valuable therapeutic measure, especially in the earlier stages of the disease. It is, unfortunately, precisely in these early stages that it is so difficult to interpret aright the true significance of the clinical symptoms, as both polycythæmia and cyanosis may be entirely absent.

*Treatment by Drugs.*—Excepting such treatment as may be beneficially employed for the relief of isolated symptoms, such as headache and constipation, drugs have very little influence on the course of the disease.

*Oxygen inhalations*, with the object of reducing the cyanosis, have been lauded by some (Bence), while others have observed no benefit from their use.

It is generally believed that oxygen is of very little value in cyanosis, as the atmospheric air invariably contains more oxygen than can be taken up by the lungs under any circumstances (Gibson<sup>5</sup>).

*Arsenic*, as used by Türk, is usually regarded as being contra-indicated, as it tends to increase the polycythæmia and aggravate the subjective symptoms. This latter effect was noted in Case II. recorded here.

Geisböck<sup>23</sup> mentions marked improvement in a case of polycythæmia hypertonica after a prolonged course of iodothylin.

Begg and Bullmore<sup>32</sup> record great benefit from large doses of quinine and inunction of the red iodide of mercury over the region of the spleen.

Iodide of potassium and the nitrites have been extensively employed, but, while marked improvement has followed their use in some few cases, this result is by no means constant.

Bearing in mind the possibility of an intestinal intoxication, lactigenised milk was employed in Case II. recorded here. The patient took  $1\frac{1}{2}$  pints *per diem*. Beyond a beneficial effect on the somewhat obstinate constipation no result was obtained.

It is natural to suppose that the coal-tar derivatives are best avoided, bearing in mind the tendency which they themselves have to produce polycythæmia (toxic erythrocytosis).

#### COMMENTS ON CASE I.

The two most striking features of this case have already been sufficiently considered, so that it is merely necessary to refer to them here.

The first of these was the existence of a greatly enlarged spleen before any polycythæmia made its appearance.

It has been suggested that this fact seems to indicate that the cause of the splenic enlargement is chiefly increased functional activity, the organ attempting to compensate for excessive erythropoiesis by increased destruction of the red cells.

The second feature of especial interest, to which allusion has already been made, was the marked beneficial influence exerted by the X-rays in the early stages of the disease. The fact that so little benefit resulted from the use of the X-rays in the recorded cases in which this method of treatment was employed is probably to be explained by the fact that the cases were too far advanced, for, as was noted in the case under consideration, the X-rays ceased to influence the condition to any material extent when the disease had reached an advanced stage.

Turning now to other special features exhibited by this case, the condition of the blood was extremely typical. When the patient was last under observation the degree of polycythæmia was rather greater than that observed in the majority of the recorded cases. The average of the counts obtained during the patient's last stay in hospital and during the time in which he attended the hospital as an out-patient is seen in the following table:—

Average Count of	Last Stay in Hospital.	As an Out-patient.
Erythrocytes . . .	9,224,000	11,320,000
Leucocytes . . .	23,680	22,800
Polynuclears . . .	78·8 %	79
Eosinophiles . . .	3	3 %



On one occasion the red blood corpuscles attained the extraordinary figure of 13,250,000, a degree of polycythæmia which is only surpassed by Koester's case.<sup>36</sup>

Many of the usual symptoms of erythræmia were absent in this case. There was no headache and no vertigo. Constipation was never a troublesome symptom. Vomiting was only present to a slight degree, and completely disappeared after treatment directed to the stomach and never recurred. Further, albuminuria, which is so commonly found, was never present in this case.

The absence of free hydrochloric acid in the gastric contents was an interesting and misleading feature, as, taken in conjunction with the presence of a palpable tumour in the upper part of the abdomen, it raised the suspicion of a gastric carcinoma when the patient first came under observation.

Regarding the primary factor at work in this particular case in producing the bone-marrow changes, it is only possible to theorise. When the patient first came under notice oral sepsis and gastric disorder were prominent features of the case.

If we apply the toxin theory to this case, and suppose that the unhealthy condition of the upper part of the digestive tract gave rise to a toxæmia which produced the bone-marrow changes, these changes must have been permanent, since the polycythæmia showed no tendency to abate after the original focus of toxin formation had been removed by medicinal and dietetic treatment.

It is interesting to note that, notwithstanding the existence of a high degree of polycythæmia and great splenic enlargement, this patient is now in excellent health, and is actively engaged in the pursuit of his calling.

#### COMMENTS ON CASE II.

This case is an instance of the rare form of erythræmia in which splenomegaly is absent. Apart from this unusual feature the case was extremely typical, and exhibited in a marked degree all the salient characteristics of the condition.

Turning in the first instance to the blood, there was an absolute and persistent polycythæmia. The average count of the erythrocytes was 8,920,000. There was also a very great increase in the viscosity of the blood. The leucocytes invariably showed an increase in their total number, the average being 12,400; of these latter the polynuclear leucocytes always showed a percentage considerably above the normal, averaging 79 per cent. The eosinophiles were similarly increased, and averaged 3·7 per

cent. . Apart from the condition of the blood, all the usual subjective symptoms of erythraemia were present in this case in a marked degree. Headache, vertigo, vomiting, and constipation were all prominent features of the case, and were the symptoms on account of which the patient sought advice.

Albuminuria, which is such a common finding, was present during the whole of the patient's stay in hospital. There was, moreover, no ascertainable cause for the development of a condition of erythrocytosis. No opportunity of examining the bone-marrow in this case was forthcoming, but it is justifiable to assume, from what observations in similar cases have shown, that it was in a state of abnormal erythropoietic activity.

With regard to the primary causal factor, which in this case lit up the activity of the bone-marrow, no source of a condition of toxæmia could be found, with the exception of the alimentary tract.

Thirst, vomiting, and marked constipation were present, all of which were greatly alleviated by diet and such drug treatment as seemed necessary. If the condition of the alimentary tract was the source of a toxæmia bringing about changes in the bone-marrow, then, as in Case I., these changes were permanent, since the polycythæmia persisted after the gastric and intestinal symptoms had been relieved. No treatment, other than that employed for the relief of the gastric and intestinal symptoms and the severe headaches, proved of any value in this case.

Iodide of potassium was given, but no result was obtained from its use.

Arsenic, even in the minute doses which were used, undoubtedly aggravated the subjective symptoms.

Lactigenised milk, as already mentioned, helped to bring about a more healthy condition of the digestive tract, but further than this nothing was gained by its use. The patient left hospital with his subjective symptoms completely arrested, and at the present date he is in the enjoyment of excellent health, but the polycythæmia still persists.

#### CONCLUSIONS.

Although it may be a matter of great difficulty to exclude the presence of conditions which might give rise to an erythrocytosis, yet, if the post-mortem examinations, in which no such conditions were found, are considered, it must be admitted that cases of erythraemia, as defined here, do exist. It will be seen that only

a very thin line divides cases of erythrocytosis and cases of erythræmia, a line which may disappear with increased knowledge; for if it were known that some toxin or other was always the exciting factor in erythræmia, and if the nature of these toxins were certainly known, then cases of erythræmia would become cases of erythrocytosis, and the toxin would stand in the same relation to the bone-marrow changes in the one case as pulmonary stenosis does in the other. The only true cases of erythræmia would then be the congenital erythræmias in which the marrow retains its foetal characters.

Passing to the more practical aspect of the subject, the most important conclusion in the light of our present knowledge which forces itself upon us from a consideration of the cases recorded here, and especially Case I., is that an early diagnosis is the first essential if treatment is to be employed to the best advantage. It has been said that the prognosis of erythræmia is ultimately bad, but if the disease is recognised early, and if X-ray treatment is at once adopted and systematically carried out, a fatal termination may be avoided for many years. Such an early diagnosis may be difficult, but it is in no way impossible, and a careful consideration of the symptoms, together with an examination of the blood from time to time, will almost certainly lead to a correct interpretation of the condition. To the interesting question of the cause of the splenomegaly, around which so much controversy has raged, reference must again be made. It has been tentatively suggested that the cause of the splenic enlargement is increased functional activity of the organ. Naturally no dogmatic statement has been made, since the evidence adduced by a single case cannot be considered to settle the question once and for all. But at the same time special interest and possibly special value may with justice be claimed for this case, for the opportunity which was present in this case of observing the initial stages of the disease never arose in any of the cases recorded in the literature.

#### ADDENDUM.

In order to render more clear the method adopted for procuring the bone-marrow in Case I., it seems to me that it would be well to add the following note:—

In the summer of 1908 the tibia was trephined by Mr. Caird, and after removing a small portion of bone-marrow, the disc of bone was replaced. From the marrow thus obtained the films here reproduced were made.

It should further be added that Case I. was described and discussed by Dr. G. A. Gibson before the Medical Section of the British Medical Association at Sheffield in 1908 (*Brit. Med. Journ.*, 1908, vol. ii. p. 1155).

For permission to publish these two cases, I desire to record my deep sense of gratitude to Dr. G. A. Gibson.

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SOME CONDITIONS ASSOCIATED WITH ENLARGEMENT  
OF LYMPHATIC GLANDS.<sup>1</sup>

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I INTEND to limit what I have to say this afternoon to those conditions in which enlargement of lymphatic glands is to be looked on as a sign of general disease and to exclude from my purview all those enlargements which result from local infection or irritation. This limits me therefore, in effect, to the consideration of Hodgkin's disease—particularly its diagnosis from tubercular adenitis and the treatment required for the two diseases—lymphatic leucocythæmia, acute leucocythæmia, and glandular fever. Bubonic plague and sleeping sickness, in both of which enlargement of lymphatic glands is a characteristic feature, may be ruled outside our consideration, as so little likely to be met with in this country.

Here is a boy suffering from Hodgkin's disease. He is not one of the most striking cases, since the glands that can be felt are limited to the neck on both sides, but the spleen is enlarged so as to project 2 or 3 inches below the costal margin. The cervical glands are far and away the most commonly affected in this disease, and in not a few cases none other of the groups of superficial glands is involved, though it is seldom that some of the internal glands are not enlarged at the same time. Thus one may be able to feel the masses of enlarged retroperitoneal and mesenteric glands, or infer the presence of enlargement of bronchial or mediastinal glands from the effect of their pressure on the respiratory passages or the œsophagus. And it is not uncommon, as in this case, to get ascites, as the result of enlargement of the glands, in the hilum of the liver, causing interference with the portal circulation.

When in addition to the cervical glands the axillary or inguinal are also enlarged, or the spleen is to be felt below the costal margin, the diagnosis from tubercular adenitis is easy, but when the condition is limited to the cervical, it is not always so straightforward. There is a difference in the character of the glands in the two conditions. In Hodgkin's disease there are usually a large number of smallish glands (in addition, perhaps, to a

<sup>1</sup> Opening address of a series of medical post-graduate clinics at the Ancoats Hospital, 20th October 1910.



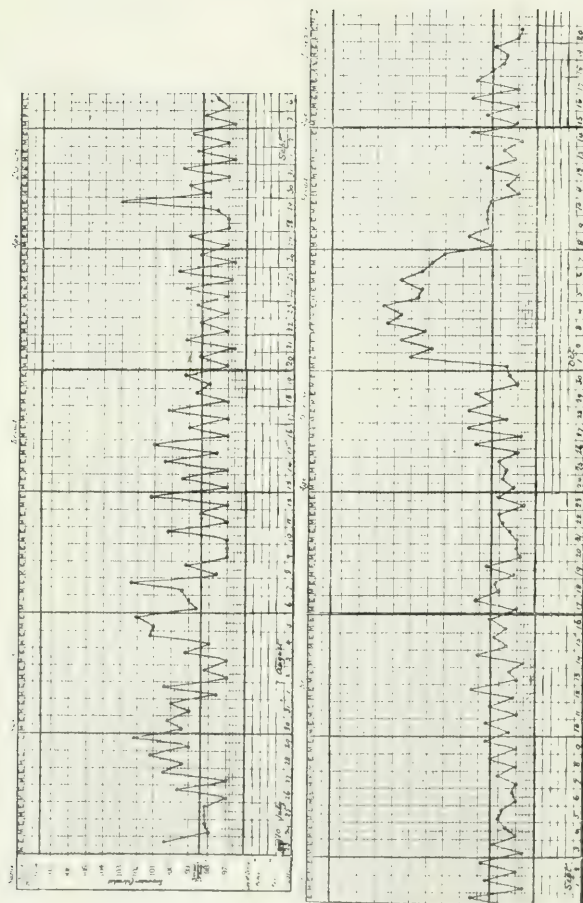


CHART II.

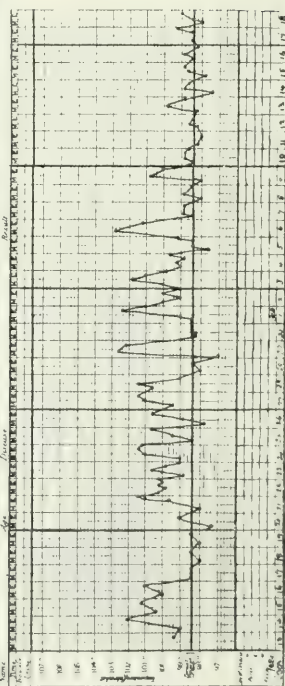
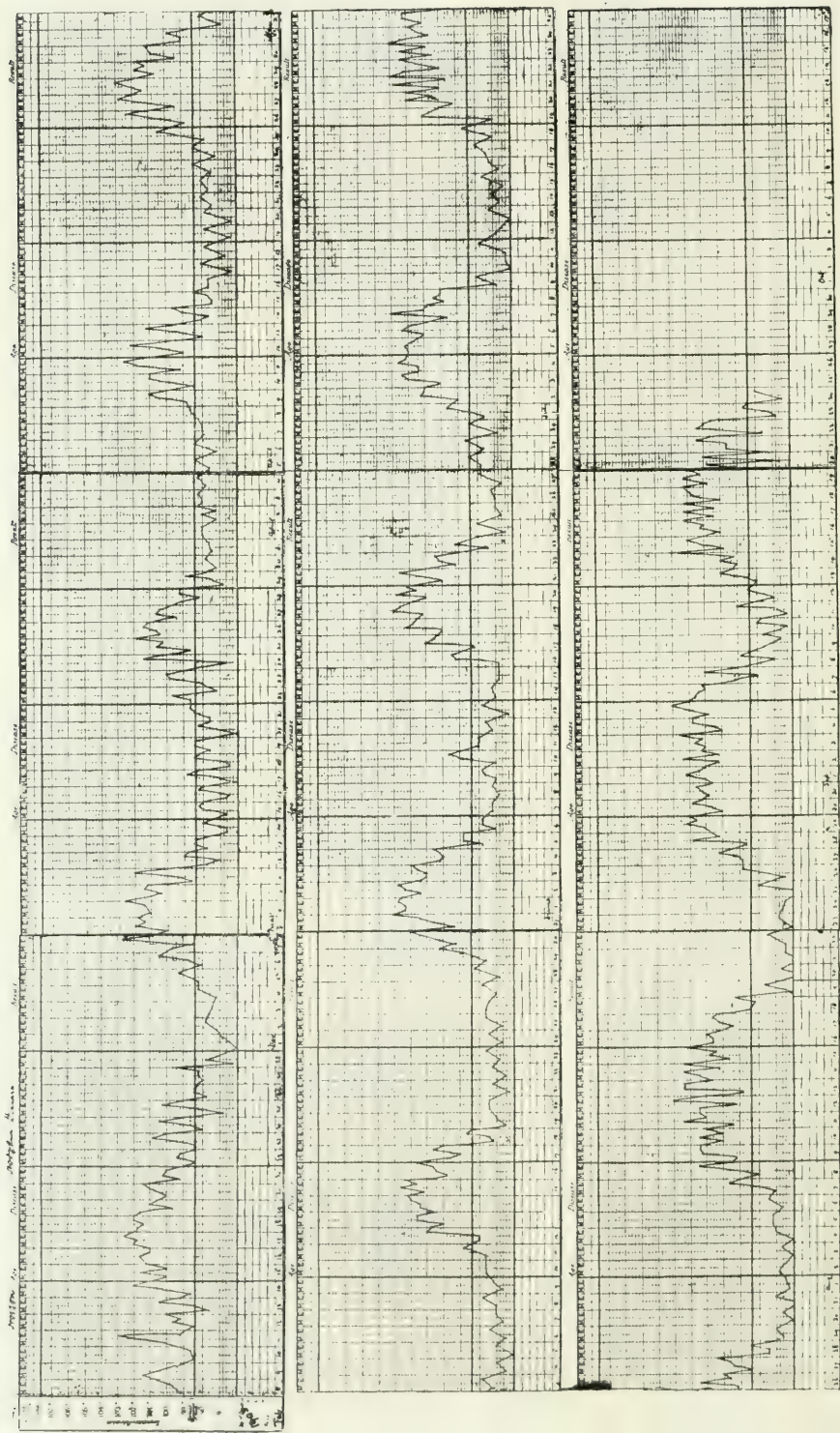


CHART III.







few large ones), many of them no larger than peas or small beans, and they are also discrete and freely movable on each other and on adjacent tissues, superficial or deep. Softening and abscess formation are very rare. In tubercular adenitis, on the other hand, the enlargement is commonly limited to a few glands of great size, and there is a tendency for these to be matted together and to be more or less adherent to skin and deeper structures. Any evidence of softening and breaking down of the glands is strongly suggestive of tuberculosis.

It is unfortunate that no absolutely conclusive differential diagnosis can be arrived at by an examination of the blood. Some light may be thrown upon the matter by a complete examination, but it is not the case, as is frequently thought, that a final and complete diagnosis can be made from the blood alone. In advanced cases of Hodgkin's disease there is almost always a severe grade of anæmia, though in the earlier stages often little or none. The distinctive feature, however, is a diminution in the number of the leucocytes—down to 3000 or 4000 per c.mm. or less, from the normal of about 8000—with a relatively high proportion of lymphocytes—40 or 50 per cent. instead of 20 to 25 per cent.—and a corresponding deficiency in the polynuclears. If this condition be found in a doubtful case it is strong presumptive evidence of Hodgkin's disease, but unfortunately it is not met with in every case which on other grounds one must diagnose as such, or, if present at times, may, when the examination is made, be disturbed by some temporary cause. Thus in one very well-marked case that I was recently asked to see the leucocyte count was no more than 1250 in the c.mm., whilst on the other hand in the boy I show you this afternoon there is a slight increase in the number of leucocytes—to 11,200 per c.mm.—and the proportions of the different varieties of leucocytes do not depart materially from the normal.

An even more characteristic feature of Hodgkin's disease is the temperature chart. This child's chart (Chart II.) shows very well the way in which the temperature behaves. You see that soon after admission it was somewhat irregularly raised and that it then fell to normal and remained so for a long period, then suddenly rose and remained high for a week or so and subsequently once more fell to normal. A still more remarkable chart is this (Chart I.), which is a copy of the record kept by a devoted mother for over eight months. Such a chart in itself is to me absolutely diagnostic. I know of nothing else that could give rise to such a long and regular recurrent periodic pyrexia. You may not always

get so complete a picture as this, but if you have to do with a case with enlarged glands, in which the temperature, after keeping quiet for a while suddenly begins to rise, suspect Hodgkin's disease. The temperature in tubercular adenitis is either normal throughout or else shows the regular hectic character of tubercular infection, and never takes on this recurrent type. Occasional cases of Hodgkin's disease are met with in which this feature is absent, but some approach to this form is the more usual.

There is one more mode of discrimination to which I wish to refer, which I hope may be of considerable help in the future, viz. Calmette's ophthalmic tubercular reaction. I have used it in several doubtful cases now, with most satisfactory results, that is to say, those in which it proved negative showed in their future course the usual features of Hodgkin's disease, whilst those in which it was positive eventually gave other evidence of their tuberculous character. Here is a child of 12 with very decided enlargement of glands on the right side of the neck, much smaller now than they were a year ago when I first saw her. There were also one or two quite small glands in each axilla. On the strength of these features I made a provisional diagnosis of Hodgkin's disease, but on taking her inside and trying Calmette's test she reacted most violently, so that there could be no doubt whatever that the condition was tubercular. It will be a very valuable advance if more extended trial confirms the dependability of the test, and it will at the same time sweep away the doctrine widely held in Germany and favoured by Pinkus in his article in Nothnagel's *System of Medicine*, but which seems to me absurd, that practically all cases of Hodgkin's disease are tubercular in origin. The nature of the disease is still in dispute. The multiple origin in a number of glands suggests an infective origin rather than true tumour formation. Yet, on the other hand, tumour formations of multiple origin in other structures, as skin, nerves and cartilage, are not unknown, and one occasionally sees some of the glands breaking through their capsule and invading surrounding tissues in such a way as to suggest a lymphosarcoma springing from a previous tissue of a lymphomatous character. There are some striking analogies with trypanosomiasis; the early infection of the lymphatic glands, the long-standing remissions, the periodic fluctuations in the number of trypanosomes in the blood which has been recently detected and which suggests the recurrent activity of the symptoms, both local and general, in Hodgkin's disease which the temperature chart reflects, as well as the extraordinarily satis-



factory, though as a rule unfortunately only temporary, results which administration of large doses of arsenic produce, suggest that in Hodgkin's disease we may have to do with an allied protozoal infection: whilst again its resemblance to a long-drawn-out recurrent fever would prepare us to learn without surprise that an observation has been recorded of spirochaetæ in the glands, though no final and conclusive results have as yet been arrived at.

The question of accurate diagnosis becomes most urgent when the treatment is to be considered. Tubercular adenitis, though in my experience in its early stages particularly amenable to medical treatment, is a condition which is liable to drift into the hands of the operating surgeon. The complete removal of the glands is a speedy and direct route to results which other methods attain more slowly. But my opinion, based on a considerable number of cases, is that operation in Hodgkin's disease is always unsatisfactory and in some cases disastrous. The disease is never cured thereby, and in some cases, after removal of what appears the only group of glands affected, the other glands throughout the body, both superficial and deep, speedily become involved, and the course of the disease is rapidly hurried forward. So you will see how important it is to arrive at a fully considered diagnosis before any question of operation is discussed.

I have already referred to the effect of arsenic in Hodgkin's disease. In some cases the benefit derived is almost miraculous, in others it is less effective. So striking is the effect in some cases that its use has a diagnostic value, as that of quinine has in malaria. Rapid improvement under it in a doubtful case indicates Hodgkin's disease. In any case it must be given in full and increasing doses, starting with five minim doses of liq. arsenicalis three times a day and running up rapidly in ten days or a fortnight to twelve or fifteen minim doses, then after a few days it is to be cut down, the smaller doses resumed, and after a while the rising doses repeated. I have thought that the reason why children often respond to the treatment even more satisfactorily than adults is because it appears that they are able to tolerate a larger dose of arsenic in proportion to their weight than grown-up people can. A few grains of potassium iodide sometimes assist in the treatment, and general tonics and good hygienic conditions undoubtedly aid the arsenical treatment and particularly help to ward off what one always fears, the *recurrence* of the glandular affection. Indeed the most satisfactory results have been obtained by combining with the specific treatment indicated the open-air

life and general régime that have proved so serviceable in tuberculosis. The main difficulty to contend with is the constant tendency to relapse—a renewed activity in the glands weeks or months after apparent cure—and with each such relapse it is commonly found that the arsenic and the rest of the treatment described have greater difficulty in giving relief. Still some cases are undoubtedly cured, though over each such case that one sees one is inclined to ask the question—Was my diagnosis correct: was I not perhaps misled by an unusual case of tuberculous adenitis?

One such case I have here to show you. At the end of 1907 he had large masses of glands on both sides of his neck which had all the characters of Hodgkin's disease. He was put on large and rapidly-increasing doses of liq. arsenicalis, and after a few weeks the enlargement of the glands began to go down. Calmette's reaction was negative. Under continued but gradually lessening doses of arsenic and potassium iodide, along with fresh air and general tonics, the glands steadily diminished, and in a little over a year had completely returned to normal. He has persevered with treatment and has shown no sign of relapse, unless we are to look on as such a slight swelling of some of the glands for a few days in June of last year, and again in February of this year, when for a short time he was without medicine. He shows well the need of keeping under treatment long after apparent cure. I can recall several cases who have given up medical attendance in the belief that they had been permanently cured, or who had been allowed to go on a voyage or to some distant health resort, with the most unfortunate results from thus getting out of touch with medical treatment, in the form of rapidly-occurring and stubborn relapse.

But unfortunately the greater number, it may be after some years of fairly comfortable life, eventually fail to respond to the treatment which earlier was so effective, even though it has been carried out regularly and with perseverance and intelligence. It may be that even at this stage the large external glands will once more shrink away, but shortness of breath or difficulty of swallowing indicates that the mediastinal glands are increasing, or other groups of internal glands may supply evidence that they are defying the hitherto successful treatment. Death not uncommonly comes rather suddenly, by the supervention of a toxic condition reminiscent of diabetic coma or uræmia.

I have not had much experience with the new organic prepara-

tions of arsenic, atoxyl, arsacetin, or the new Ehrlich-Hata preparation "606," but I have given trials to the two former in other cases of blood disease in which the older preparations of arsenic had lost their efficacy, without success. They are, moreover, none of them free from considerable risk. But the root idea underlying the use of the last-named preparation is of much interest, and I would like to refer to it here. It is now well recognised that certain organic arsenic preparations injected into an animal infected with trypanosomes will destroy large numbers of the infecting organisms, but not all, and that after a while the parasites will make their reappearance in the blood. And further, subsequent injections become less and less effective in destroying or checking their growth; the trypanosomes have indeed acquired immunity against the drug used. The spirochætae of syphilis, which biologically are akin to the trypanosomes, appear to acquire a similar immunity towards the drugs used in the treatment of the disease, since it is found to be well-nigh impossible to eliminate the infection completely. A constant endeavour therefore is being made to discover such an organic arsenic preparation as may be given safely in such a massive dose—the "*therapia magna sterilans*"—that all the infecting organisms may be destroyed at a blow by a single injection, and none left to acquire immunity against the drug. The analogy between Hodgkin's disease and trypanosomiasis, which I have already pointed out, suggests that there are possibilities of success in the former along the same line.

I have only one word more to add with regard to the treatment of Hodgkin's disease, and that refers to the use of the X-rays. Speaking generally, I should class the X-rays along with arsenic as of equal value in the treatment, with, however, the same drawback, that they appear to lose their effectiveness after a while and to lead only to temporary and not permanent cure. Still, I have found cases in which arsenic has been tried with success but in which it finally has lost its effect, which have received further benefit when the X-rays have been resorted to, and so their use adds to our powers of dealing with the disease.

The treatment of tubercular adenitis comes mainly, as I have already noted, into the hands of the surgeons. Yet if only these cases come early enough under observation—before there is any breaking down or much periglandular inflammation—most excellent results may be attained without operation. Small doses of arsenic and iron and potassium iodide, given along with cod-liver oil and creosote or carbonate of guaiacol, and the local application of

Scott's dressing will often rapidly clear away even large masses of tubercular glands.

Now, in contrast with the difficulty in diagnosis between Hodgkin's disease and tubercular adenitis let us consider another case which seems to have many points in common with the case of Hodgkin's disease with which I opened this lecture. This boy, also, has enlargement of glands in various parts of the body—neck, axilla, and groins—whilst the spleen is just palpable. Let us examine the blood here: we find the red corpuscles considerably reduced, but the leucocytes are increased up to 50,000, and the vast proportion of these, no less than 99 per cent., are small lymphocytes. We have here, then, to do with a case of lymphatic leucocythæmia. The symptoms and physical signs closely resemble those of Hodgkin's disease (hence the German name of pseudo-leukæmia for the latter), but the diagnosis is at once clear on making a complete blood examination. The course of the disease is much the same as in Hodgkin's disease but the prognosis is more grave; treatment with arsenic or the X-rays may delay the fatal ending, but as a rule it runs its course more rapidly, and permanent cure, such as may be met with in Hodgkin's disease, does not occur in lymphatic leucocythæmia.

There is another form of leucocythæmia to which I should like to call your attention, viz. acute leucocythæmia. Enlargement of various groups of lymphatic glands is a feature of many cases of this disease, but there are many other cases again which run their whole course with no enlargement or perhaps only a very transient and insignificant enlargement of either the glands or the spleen. It is generally regarded as a rare disease, but I am confident that many cases run their course to a fatal ending without recognition, being diagnosed as obscure septicæmia of uncertain origin, since there may be none of the commonly recognised signs of leucocythæmia—neither enlargement of glands or of spleen—to suggest the nature of the disease, whilst the general characters of the illness suggest simply an acute septicæmia. Take, for instance, this case which is very vividly fixed in my memory. A girl of 23 had been anæmic and poorly for four months before admission to a Manchester hospital, but had kept regularly at work till a few days before. Then diarrhœa and vomiting set in, with temperature of 101° F., and pain in the epigastrium. She was drowsy and apathetic, her mouth was offensive, with swollen and hæmorrhagic gums. She rapidly got worse, and as it was thought that a mass could be felt in the right loin she was transferred to the surgical



side and explored in the hope that an abscess would be found as the cause of the symptoms. Nothing was found, however, and the patient died, and even at the post-mortem no lesion could be discovered to account for her illness and death. I happened to hear casually about the case, and, suspecting its nature, I went to the post-mortem room and secured a drop of blood for examination, and was able to demonstrate the leucocythæmic condition present.

Another case that I saw in the spring of this year had an obscure febrile illness, with increasing weakness and anemia, for which he had spent a considerable period in a fever hospital as a case of enteric. He had been discharged a good deal better, but on a relapse occurring, with more urgent symptoms, I was asked to see him. Again this obscure febrile disease associated with progressive anemia aroused my suspicions, and on examining the blood I found a great increase in the leucocytes and all the characteristic appearances of acute leucocythæmia. There is no possibility of doubt when the great increase in leucocytes is discovered, with a high proportion of mononuclear cells, the majority of which are the so-called large lymphocytes. But there is real difficulty in those occasional cases in which during a considerable part of the illness there is no increase in the leucocytes. Thus in one case that I had in the hospital last year the highest count of the leucocytes, for some weeks, was only 10,000 per c.mm., and it was only a few days before the fatal termination that they suddenly rose to 150,000. It was possible from alterations in the characters of the red and white corpuscles, into which I need not enter here, to suspect the nature of the disease in the earlier stages, but for this a very careful and accurate examination was requisite.

And now, finally, I want to say a few words about another disease which is characterised by enlargement of glands, viz. glandular fever. The disease is not very rare but is sufficiently seldom met with to make it unfamiliar, so that it may give a good deal of trouble before it is correctly recognised. Within a few weeks I saw one case and was told of two others which had been diagnosed as acute Hodgkin's disease, with, of course, a very grave prognosis and consequently much worry and unhappiness. Here is the temperature chart from the case that I saw (Chart III.). The rise in the first week appeared to be a slight influenzal attack, from which the patient, a boy of 14, got quite well and able to go out. Then this curious irregular, sometimes completely inter-

mittent, pyrexia developed, along with swelling of various groups of glands, first those on the left side of the neck, later those on the right, also those in both axillæ and both inguinal regions. The abdominal glands could not be felt but they may have been enlarged, as also the spleen. The sudden rises of temperature after the intermissions corresponded with the outbreak of activity in fresh sets of glands. The glands were very tender and the boy was acutely ill. There was some slight pharyngitis, sufficient to suggest that it was the original locus of infection, but it was not marked. Two other children in the family had short feverish attacks, with swelling of glands in the neck but not elsewhere. The boy got perfectly well after the illness had lasted for three weeks.

The disease was first described by Pfeiffer in 1889. It occurs only in children and has all the characters of a hitherto unrecognised acute specific infectious disease. It appeared in this case to follow upon a definite attack of influenza, and the possibility presents itself that it may be only an aberrant type of influenza in which the brunt of the attack falls upon the lymphatic glands. The date at which the disease was first described, viz. 1889, somewhat confirmed my suspicions, since it just about coincides with the reintroduction of influenza into Europe, but on referring to the original papers of some of the earlier observers I found that many of their cases were of a date much anterior. So that we may put on one side its influenzal nature and take it that the early rise of temperature in this case was really the earliest sign of the specific infection, although the very careful and experienced practitioner with whom I saw the case has remained unshaken in his opinion that the early attack was a typical influenzal one. Be that as it may, it is well to bear the condition in mind, both for your own credit and for the peace of mind of yourself and your patient's friends.

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## MEETINGS OF SOCIETIES.

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### Edinburgh Medico-Chirurgical Society.

A MEETING was held on 11th January, Dr. Byrom Bramwell, President, in the chair.

Mr. Cathcart showed a patient who illustrated the advantage of re-suture of the facial nerve when divided during removal of a parotid tumour. The tumour was deep-seated, and the pes anserina was stretched over it. The injury was not recognised till recovery from the anæsthesia. Next day the wound was reopened and the surface searched with electrodes for the distal ends of the divided nerves. When found, these were united to the proximal ends, and recovery resulted five months later. Mr. Cathcart also showed a man with a large fistulous opening just above the hyoid bone, resulting from attempted suicide by cut-throat. The case illustrated the formation of a fundamental vowel sound produced by the vocal cords and the fact that the special vowel sounds are produced by modifications of the laryngeal sound in the mouth.

Mr. Cotterill showed a diverticulum which extended from the cæcum to a point beyond the hepatic flexure. The diverticulum lay between the layers of the mesentery and contained a large faecal concretion.

Dr. A. D. Webster gave a demonstration of exercises calculated to maintain the bodily functions in health.

Dr. J. C. Thomson read a paper on the "Present Position of the Treatment of Plague." The general management of a case was described. Cardiac stimulants from the beginning were advocated, antipyretics were contra-indicated. The specific treatment most favoured was carbolic acid in very large doses. Hypodermic injections of adrenalin were worth further trial.

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## RECENT LITERATURE.

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### CRITICAL SUMMARIES AND ABSTRACTS.

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#### SURGERY.

#### THE DIAGNOSIS OF CONGENITAL DISLOCATION OF THE HIP IN INFANTS.

THE question of early diagnosis in congenital dislocation of the hip is one of great importance, but the condition is often unrecognised until

the patient is several years old, which is chiefly due to the fact that the more prominent symptoms do not show themselves until the patient begins to walk, or even until a later date.

In the *Gazette Hebdomadaire des Sciences Médicales de Bordeaux*, 6th November 1910, Petit de la Villéon publishes an interesting article on the question of diagnosis of the condition in infants and very young children. He points out the great importance of early diagnosis, and states that most surgeons are agreed that the earlier the condition is treated the better. In those children who have not yet walked or are just beginning to walk the diagnosis is very difficult, as the chief symptoms do not show themselves before that time. The question then comes to be—By what symptoms can the condition be recognised at this early stage? The diagnosis may be made, according to Hoffa, by the recognition of the rubbing of the head of the femur against the posterior border of the acetabulum, and Bade has described as an early symptom the shortening of the adductor muscles of the thigh. Neither of those methods, according to the writer, is sufficient to establish a diagnosis. He also considers that radiographs of very young children present special difficulties; it is therefore important to have a satisfactory clinical method of recognising the condition.

Internal hyper-rotation of the femur is only possible in cases in which there is some pathological defect in the hip joint. This symptom of congenital dislocation of the hip has been studied by Gourdon and also by Trillat; it may, however, also be met with in cases of articular relaxation, torsion of the shaft of the femur, and paralysis of the psoas muscle; therefore a very careful examination must be made. Villéon approves of Gourdon's method, with the exception of one movement, *i.e.* the one in which the knee on the affected side is adducted beyond a right angle to the pelvis; in this movement he considers there is both an anatomical and geometrical error. Trillat's method he considers less precise, and objects to it because it allows any laxness of the knee-joint to come into play.

The technique which he suggests is as follows:—The child is laid on its side on a table with the suspected limb uppermost; the surgeon faces the child and flexes the thigh upon the abdomen to a right angle; the leg is also bent to a right angle with the thigh. The surgeon grips the child's knee with the one hand, taking care that the femoral axis is kept horizontal, that is, parallel to the surface of the table; in other words, there must be no adduction of the thigh, the knee being prevented from falling towards the table; the femur is then internally rotated. The surgeon stops as soon as the least resistance is met with. If resistance occurs after the leg has passed through an angle of  $45^\circ$  the joint may be considered normal; if, on the other hand, the operator is able to rotate the leg with ease to an angle of  $90^\circ$ , congenital dislocation of the hip may be diagnosed. During those manipulations the free hand



should be laid on the buttock and follow the changes which take place in the head of the femur during the movements. Villéon considers that errors are avoided by carrying out the movements of internal hyper-rotation with the femur rigidly horizontal, in other words, the long axis of the femur must be kept at right angles to a line drawn from one acetabulum to the other. The writer considers the method described as diagnostic of the condition, and has frequently verified his observations by radiographs.

One great difficulty has not been touched upon in the paper, *i.e.* the fact that the condition is rarely suspected at that early stage, and therefore the surgeon does not have the opportunity of carrying out the examination at the time suggested by the writer.

GEORGE CHIENE.

#### TRANSGASTRIC EXCISION OF GASTRIC ULCER.

According to W. J. Mayo (*Annals of Surgery*, December 1910), the frequency with which malignant disease develops upon gastric ulcer leads to the conviction that chronic calloused ulcer of the stomach is best treated by excision. If thereby mechanical conditions are created which interfere with the progress of food, gastro-jejunostomy should be done as a supplementary procedure. For ulcers lying in the pyloric end of the stomach, the best treatment is partial gastrectomy, with complete closure of the end of the duodenum and stump of the stomach, and independent gastro-jejunostomy. In saddle ulcers of the lesser curvature, excision may ordinarily be performed without difficulty, and the same is true of ulcer of the anterior wall. In the type of ulcers of the posterior wall, which are so often adherent to the pancreas and other retro-gastric structures, excision is difficult. In some cases Mayo has made a transgastric excision of the ulcer. The steps of the operation are as follows:—The gastro-hepatic and gastro-colic-omenta are opened above and below the ulcer, gauze protection is introduced, adhesions are carefully separated, and, if possible, the ulcer surface is cut free from the posterior attachments without opening the stomach. A piece of gauze is packed into the denuded area behind, and this is usually sufficient to stop hæmorrhage without the ligation of vessels. The anterior wall of the stomach is opened, and, with the fingers behind, the entire ulcerated surface is pressed through the anterior incision and the ulcer excised. The gap is closed with transverse through-and-through sutures of chromic catgut introduced from the mucous side, and this suture line is reinforced by several mattress sutures of linen, also applied from the mucous side, to prevent separation due to the early absorption of the catgut. The anterior wall of the stomach is then closed. Several drains of rubber tissue are carried down behind the stomach and brought out at the upper end of the abdominal wound.

JAS. LOCHHEAD.

## INTUSSUSCEPTION OF THE APPENDIX.

In reporting a case of this rare variety of intussusception, and reviewing twenty-four others which he has collected from the literature, A. V. Moschowitz elicits several interesting details with regard to the condition (*Medical Record*, 17th December 1910). The intussusception may start at Gerlach's valve, that is the junction between the appendix and cæcum, and as more and more becomes inverted, the process may cease by swelling of the coats or adhesions of the apposed serous surfaces. A portion of the distal end of the appendix projects from the cæcum, and for this reason the variety may be termed a "partial" intussusception. If a longitudinal section is made through the cæcum and intussusception, the intestinal coats will be cut six times. Of this variety six cases have been reported. If the process continues, the glove-finger inversion is produced, in which, as a rule, no trace of the appendix is visible from the outside. On longitudinal section only four layers are found. Four cases of this variety are on record. The inverted appendix may act as a foreign body, and in the efforts to propel it along the canal more and more of the intestine is drawn into the intussusception. The invagination of the appendix is recognised after the major portion has been reduced. Of this variety fifteen cases have been reported. In no case has the invagination of the tip into the lumen of the appendix been observed.

Of the twenty-five cases twenty were reported by American and British observers; this is in agreement with the statistics of intestinal intussusception, which has been proved to be far more prevalent among Anglo-Saxon peoples than among others. The age incidence is the middle of the first decade. The most important symptom is the intense cramp-like pain around the umbilicus, coming on in paroxysms, and then disappearing for an interval, during which the patient feels perfectly well. The periods of pain and well-being vary in frequency from one or two to many in a day. The intussusception of the appendix usually lasts for several weeks before it becomes complicated by an intussusception of the ileum into the colon. The presence or absence of a tumour is usually difficult to make out owing to the rigidity of the abdominal wall. The bowels move spontaneously or readily with purgatives, and gross blood and mucus have rarely been observed. In the case of Moschowitz small quantities of blood were passed after an attack.

JAS. LOCHHEAD.

## THE REMOVAL OF A URETERAL CALCULUS.

H. Cabot draws attention to some points in the technique of operations for stone in the ureter (*Boston Med. and Surg. Journ.*, 24th November 1910). When it is impacted at the narrowing opposite the lower pole of the kidney, the best incision is one extending obliquely downwards

and forwards from the tip of the twelfth rib to a point midway between the anterior superior spine of the ileum and the umbilicus. The fibres of the external oblique are separated in the line of the incision, and those of the internal oblique and transversalis practically at right angles to the incision. The peritoneum is pushed back, and the ureter is found adhering to it, or lying on the psoas muscle. When the stone is situated at the level of the pelvic brim, the incision should begin midway between the anterior superior spine and the umbilicus, and proceed downwards and forwards to the junction of the inner and middle thirds of Poupart's ligament. When the peritoneum is pushed back the ureter is exposed where it crosses the bifurcation of the common iliac artery. For stone in the last two inches of the ureter, the incision advised by Gibson gives the best access. It starts in the middle line a finger's breadth above the pubes, runs horizontally out nearly parallel to Poupart's ligament, and turns sharply up at the centre of the ligament to end opposite the anterior superior iliac spine. The aponeurosis of the external and internal oblique is divided in the line of the incision, and at the outer border a few fibres of the internal oblique may have to be cut across. The upper flap is retracted, the outer border of the rectus defined, and the transversalis fascia divided by a vertical incision. The peritoneum is then stripped back, and when the patient is put in the Trendelenburg position, the base of the bladder and lower part of the ureter are well seen. Cabot is of the opinion that the ureter is usually inflamed and ulcerated at the point at which the stone is lodged, and that incision through the ulcerated tissue is likely to result in sloughing, and increase the stenosis of the lumen, hence he pushes the stone up the dilated part for one or two inches, and then incises the ureter on it. The dilated portion above the stone is also more easily sutured than the constricted portion, and two layers of stitches may often be inserted without risk of stricture. In every operation care should be taken, by the passage of a bougie upwards and downwards along the ureter, to establish the permeability of the channel. Any stricture must be treated or a second calculus removed.

After extraction of the calculus, Cabot does not advise the introduction of a catheter and its maintenance in the ureter for a few days. His chief reason is that the opening into the bladder permits only a small-sized catheter to be employed. Higher up the ureter is dilated, and thus urine and pus are bound to collect in the ureter outside the catheter, hence leakage at the wound will almost certainly occur. While sympathising with the drainage of the abdominal wound down to the opening in the ureter, Cabot states that it is not necessary, even in septic cases, if the ureter is well closed. He has dispensed with drainage on three occasions, and the wounds healed by primary union.

JAS. LOCHHEAD.

## NEW OPERATION FOR ADOLESCENT HALLUX VALGUS.

According to J. K. Young, hallux valgus frequently begins during adolescence. He states that many cases of this type are associated with a change in the articular surfaces of the first tarso-metatarsal joint (*Amer. Journ. of Orthoped. Surg.*, February 1910). The change is due to the presence of a wedge-shaped supernumerary bone, akin to the inter-metatarsium described by Dwight (*Variations of the Bones of the Hand and Foot*, 1901). As this bone develops its base lies towards the fibular side, and the increased width of the base forces the external border of the base of the first metatarsal downward, increasing the tension on the ligaments and tendons, particularly the flexor brevis hallucis and extensor longus hallucis, and finally produces the characteristic abduction of the first metatarsal. With the exception of Riedl's, all the operations previously performed for hallux valgus attacked the first metatarso-phalangeal joint, and attempted to correct the deformity without removing the cause. Riedl's operation consists in a wedge-shaped osteotomy of the internal cuneiform bone, the base of the wedge being on the fibular side. On the basis of his X-ray examinations Young now describes and recommends an operation which rectifies the articular surfaces of the first tarso-metatarsal joint (*Univ. of Penn. Med. Bull.*, November 1910). A curved incision is made from the instep backwards across the joint in question, the flexor hallucis tendon is retracted to the inner side, the joint opened, and the triangular piece of bone removed by means of a chisel. The difficulty in recognising the articulation is best overcome by measuring its distance from the head of the first metatarsal with a steel measure during the X-ray examination. The removal of the triangular bone leaves a gap, which is obliterated by placing the foot in the equino-varus position. A triangular pad of gauze is placed between the first and second toes, a pad is placed beneath the arch of the foot, and a small wooden splint is applied along the inner side of the foot over the metatarso-phalangeal joint. The foot is secured in this position by a plaster of Paris dressing for three months, with the object of allowing the full restoration of the ligaments and other soft parts about the articulation. At the end of the treatment the position, as seen by the X-rays, is said to be perfect.

JAS. LOCHHEAD.

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## DISEASES OF CHILDREN.

By A. DINGWALL FORDYCE, M.D., F.R.C.P.,  
Extra-Physician to the Royal Hospital for Sick Children.

## BLOOD-PRESSURE IN CHILDHOOD.

WITHIN the last few years various observers have claimed that by the estimation of the blood-pressure valuable assistance may be gained for the determination of the prognosis and of the treatment in certain cases of disease in childhood. But modern methods for the estimation of blood-pressure have, so far, contributed little to our knowledge in this sphere of medicine. The very young child is an unsuitable subject, as a rule, for such investigations. Crying, kicking, movement generally, interfere seriously with the results obtained and render the procedure unsatisfactory. In older children it has been impossible to assign the correct value to the findings in any individual case owing to the fact that a standard of normality has been wanting. Investigators have consequently been recently concerned in determining the normal blood-pressure during childhood—during the period of growth and development, when it seems *a priori* probable that the normal is an ever-changing characteristic.

Three such investigators have recently published their results—Frau P. Wolfensohn-Kriss in the *Archiv. für Kinderheilkunde*, 53, 1910, p. 332; Kaupé in the *Monatsschrift für Kinderheilkunde*, 9, 1910, p. 257; and Seiler in the *Correspondenz-Blatt für Schweizer Aerzte*, 14, 1910, p. 433.

In each case the investigator used a Riva-Rocci instrument. Kaupé investigated the cases of 123 girls and 21 boys, and gives the following tables of results:—

## GIRLS.

Age.	Systolic Pressure.			Diastolic Pressure.			Difference between average Systolic and Diastolic Pressure.
	Max.	Min.	Average.	Max.	Min.	Average.	
3 years	103	78	93·2	96	75	87·2	6·0
4 "	90	81	83·1	81	74	74·8	8·3
5 "	88	78	81·1	81	68	72·2	8·9
6 "	98	79	90·3	90	70	81·7	8·6
7 "	117	83	90·07	105	75	82·06	8·01
8 "	110	72	90·06	101	66	82·06	8·0
9 "	100	80	91·7	91	72	82·6	9·1
10 "	102	87	96·6	94	79	89·2	7·4
11 "	106	90	96·08	100	81	87·3	8·78
12 "	100	79	91·4	92	69	82·4	9·0
13 "	111	89	99·3	102	81	90·7	8·6

He notes that the children of 3 years of age were very restless.

## BOYS.

Age.	Systolic Pressure.			Diastolic Pressure.			Difference between average Systolic and Diastolic Pressure.
	Max.	Min.	Average.	Max.	Min.	Average.	
2 <sup>3</sup> / <sub>4</sub> years	...	...	77.0	...	...	70.0	7.0
4 "	98	81	88.7	87	73	80.2	8.5
6 "	96	88	91.4	87	79	83.2	8.2
7 "	98	91	94.6	95	82	88.0	6.6
8 "	...	...	97.0	...	...	85.0	8.0
9 "	...	...	89.0	...	...	80.0	9.0
10 "	...	...	103.0	...	...	95.0	8.0
11 "	...	...	96.0	...	...	87.0	9.0
13 "	...	...	98.5	...	...	88.5	10.0

The observations of Seiler, like those of Wolfensohn-Kriss, were made in the Poliklinik of Professor Sahli at Berne.

From his figures he concludes that the normal blood-pressure increases with age, and in children of the same age is higher in those of greater size and weight.

Wolfensohn-Kriss maintains that the Riva-Rocci instrument as modified by Sahli is very suitable for use by practitioners among children. By means of it she examined the blood-pressure in about 350 healthy children in the sitting position.

She obtained the following results:—

TABLE I.

*The Blood-Pressure of Healthy Children in Relation to their Age.*

Number of Children Examined.	Age.	Blood-Pressure.		Blood-Pressure Limits.	
		Min.	Max.	Min.	Max.
20	2-3	74	80	60-95	65-100
21	4-5	76	83	65-90	70-95
26	6-7	82	90	70-90	80-105
34	8-9	88	90	75-100	80-110
38	10-11	90	98	80-105	85-115
52	12-13	95	99	75-115	80-125
34	14-15	96	101	85-110	85-120
20	16-17	105	113	85-120	90-130

TABLE II.

*The Blood-Pressure of Healthy Children in Relation to their Size.*

Number of Children Examined.	Size.	Blood-Pressure.		Blood-Pressure Limits.	
		Min.	Max.	Min.	Max.
	cm.				
20	90-100	81	85	60-90	70-95
15	100-110	83	89	70-95	75-105
17	110-120	84	90	65-100	70-110
29	120-130	87	93	75-100	85-110
39	130-140	89	95	75-105	85-115
43	140-150	93	101	75-110	80-120
27	150-160	95	104	80-120	90-130
20	160-170	101	110	80-130	90-140

TABLE III.

*The Blood-Pressure of Healthy Children in Relation to their Weight.*

Number of Children Examined.	Weight.	Blood-Pressure.		Blood-Pressure Limits.	
		Min.	Max.	Min.	Max.
	kg.				
27	15-20	77	82	60-95	65-100
24	20-25	85	92	75-100	80-110
30	25-30	88	94	75-100	85-115
44	30-35	89	95	75-110	80-120
30	35-40	91	99	75-110	80-115
18	40-45	96	103	85-115	90-125
10	45-50	105	111	90-120	95-130
10	50-60	103	112	80-130	90-140

From her figures she concludes that the blood-pressure in normal children rises (a) with increasing age; (b) with increasing height; (c) with increasing weight.

From other figures which she gives she concludes—(1) Among healthy children of the same age the blood-pressure varies according to height and weight. (2) Sex has no direct bearing on the blood-pressure.

In a short appendix Wolfensohn-Kriss states that she has had an opportunity of examining the blood-pressure in the cases of 65 sick children, most of whom were, however, not seriously ill.

In the great majority of these cases no marked deviation from the normal was discernible.

## PIRQUET'S TUBERCULIN REACTION.

In an interesting paper from the Düsseldorf Children's Clinique on the "Value of the Pirquet Tuberculin Skin Reaction" Nothmann considers the questions—Does a tuberculin skin reaction only occur in tuberculous people? Does a negative reaction necessarily mean that a person is free from tubercle infection? (*Archiv. für Kinderheilkunde*, 1910, 53, p. 146).

He considers the reaction particularly valuable in two directions: first in connection with public health, and second in very young children.

In young children its value is due to the facts that in them the site of tuberculous infection is so often deep-seated glands—more especially bronchial glands—that the diagnosis is very difficult and the X-rays are usually only of assistance when the surrounding lung is also affected, and chiefly because at this period of life all tubercle infection is active and there exist no latent inactive tuberculous foci.

In answer to the question—Are there not persons free from tuberculous infection who give a positive skin reaction? it is only possible to reply, Yes. Even in infants this appears to be the case. These infants apparently suffer from the constitutional anomaly known in Germany as "exsudative Diathese." Members of this group of cases either possess a general hypersensibility and hyperirritability of the skin and are subject to eczematous conditions, or they suffer from lymphatism, a condition which Pirquet himself looks upon as a form of "occult tuberculosis," and which the author, in agreement with Moro, Escherich and Czerny, considers the basis of the special form of tuberculous infection known as scrofula.

To limit the reliability of the test in the other direction is still more difficult. Many persons suffering from tuberculous infection give a negative reaction to Pirquet's test.

The author found that 47.1 per cent. of children gave a positive reaction to Pirquet's test, that this number was increased to 65.7 per cent. when a second test was made one week after the first on those children who originally gave a negative reaction, and when the children who reacted negatively on both occasions were thereafter injected with 1 c.cm. of 1/1000 old tuberculin solution the number reacting was increased to 77 per cent.

In explanation of a negative reaction in a tuberculous child he suggests certain classes of cases—(a) those children who have only a slight sensibility towards tuberculin (an explanation which certainly does not appear very helpful for practice!); (b) children in the prodromal stages of measles; (c) children suffering from croupous pneumonia; (d) many children suffering from active tuberculosis who are in a markedly cachectic condition the skin test being here, however, unnecessary, as the diagnosis is otherwise obvious; (e) and a certain



number of children suffering from active tuberculosis, but whose nutrition and general condition are comparatively satisfactory.

The impression left upon the reader is that the author does not make out a very strong case for the reliability of the Pirquet test, even in very young children.

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## MENTAL DISEASES.

By DOUGLAS M·RAE, M.D., F.R.C.P.,  
Medical Superintendent, Ayr District Asylum.

### THE TREATMENT OF MELANCHOLIA BY THE LACTIC ACID BACILLUS.

THIS paper by Dr. J. George Porter Phillips<sup>1</sup> marks a very distinct advance in the therapy of this affection. The work is characterised by an enviable degree of skill and industry, with gratifying results in the 18 cases subjected to the treatment. The strain of bacillus used was that of the long bacillus of Massol, which at certain times assumed a streptobacillary form, with occasional metachromatic staining with methylene blue, non-motile and non-sporing—best grown on whey agar at 38° to 40° C. The most suitable preparation is as follows:—To each litre of milk 1·5 c.c. of HCl is added and the whole boiled for five minutes to separate the casein. After filtration through fine muslin 2 grms. of maltose or lactose are added to each 100 c.c. of whey. Five to 10 c.c. of stock culture (in sterile milk) are injected by means of a sterile pipette into wool-plugged half-pint flasks. After a period of 8 to 10 hours' incubation these are ready for use in the wards, where they remain plugged till required (twice daily). The author at the same time placed his patients on a strict regimen, giving only milk, malt extract, and sugar of milk solution. After 2 days he added gruel, milk-puddings, custard, bread and butter. In from 3 to 7 days he further added yolks of eggs, cream, potatoes, fruit and vegetables, and at the end of a week fish was allowed. Acclimatisation of the lactic acid bacillus is established in a week or 10 days and lasts 12 days without re-ingestion. Although colic, nausea, headache, tinnitus and itching of the skin sometimes occurred, constipation was the only really troublesome symptom. The physical and mental improvement in the cases of true melancholia was most marked, and recovery resulted in 11 cases. He believes, in conclusion, that the lactic acid bacillus has a decidedly beneficial effect in true melancholia, by diminishing the amount of toxins absorbed from the intestinal tract and by promoting a rapid and easy assimilation of food; that the duration of the illness is shortened, by correcting defective alimentation; and that this form of treatment should prove valuable in other mental affections.

DEVIATION OF THE COMPLEMENT IN MENTAL DISEASES  
KNOWN AS MANIA.

Lewis Bruce<sup>2</sup> contributes a most original paper on this subject. Broth cultures of streptococci isolated from cases of mania and similar cultures of staphylococcus aureus and *B. coli* to act as controls were taken as antigen. Serum of the patient inactivated by heat was expected to contain the specific antibody, while the complement was supplied by the fresh serum of rabbit or guinea-pig. Inactivated hæmolytic serum plus .5 c.c. of 5 per cent. suspension of the appropriate red blood corpuscles was used as indicator. If the serum of the patient in the presence of the toxin (antigen) contained in the broth culture entered into union with the complement supplied by the rabbit serum, then upon adding .5 c.c. of red blood corpuscles plus one dose of hæmolytic serum no hæmolysis would occur, *i.e.* the complement had been deviated. Results were not uniform. He next took the urine of the patient as possibly containing the antigen, serum of rabbit immunised to streptococci (immune serum), the complement being again fresh serum of rabbit or guinea-pig. Negative results were got with urine of cases of mania and of control persons. He once more took blood of acutely maniacal persons and immunised a rabbit, 8 to 10 c.c. of serum being injected into the rabbit at intervals of 10 days on three occasions. Ten days after the last injection the rabbit was bled and its serum inactivated by heat. Urine again employed as antigen, immunised rabbit as antibody, and fresh rabbit serum as complement. Results were encouraging and specific when quantities used as by Bergerson in tubercular persons. The serum of the rabbit immunised to the serum of a manic-depressive case when mixed with the urine of a similar case deviated complement, but when mixed with the urine of confusional cases, melancholic and control persons, did not. This indicated the presence of specific toxins in the blood of maniacal cases, so he thought it probable that antitoxins would also be present. He repeated these experiments, using this time the serum of other maniacal patients as the antiserum instead of that of the immunised rabbit. This antiserum was from a case in which there was doubt as to diagnosis, being either confusional mania or manic-depressive excitement. Four controls were used; one deviated .02 c.c. of complement, while three—a melancholic, an epileptic, and a case of mania undiagnosed—were negative, and a case of confusional insanity deviated up to .08 c.c. Four cases of confusional insanity showed absorption of complement, except one which deviated up to .04 c.c. Of four manic-depressive cases, two deviated .02 c.c., but otherwise the results were uniformly negative. He considers the results place the case from which the antiserum was taken as a case of confusional mania. He admits the number of cases tested is small, but records the results as an inducement to others to repeat his experiments.

ROSS-JONES' PROTEIN REACTION.<sup>3</sup>

A paper by Dr. John Turner, in which he describes the results of his investigations with this test. As an aid to diagnosis in certain cases of insanity Wassermann's reaction possesses too many technical difficulties, and merely enables one to diagnose previous syphilitic infection in nearly all its stages. This detracts from its value as a means of special diagnosis in general paralysis or tabes. In the experience of the author Ross-Jones' test only gave a positive result in general paralysis and cerebral syphilis, whereas Henderson, Smith, and Chandler state that Wassermann's reaction often fails in early cases of general paralysis, and in even most advanced cases is negative.

In 48 cases of general paralysis Turner got negative results only twice with the Ross-Jones' test, and in one of these the diagnosis still remains doubtful. A case of advanced tabes was negative. Forty-five cases of other forms of mental disease, with one exception, gave negative results. The exception, moreover, gave a very doubtful reaction. He found Noguchi's butyric acid test not so trustworthy, just as Amsden found that Ross-Jones' test gave more definite results than Noguchi's, and that both were more delicate than Nonne's. The author in the same paper, in describing his own method of counting lymphocytes, mentions Pappenheim's observation of the disintegrating property of the cerebro-spinal fluid, especially in cases of general paralysis. He states that he prevented this by adding .1 per cent. formalin instead of heating to 56° C. as an easier method. He also notes the presence of a large number of erythrocytes in quite colourless fluid. He believes that the presence of plasma cells from a perfectly clear fluid justifies a diagnosis of general paralysis, tabes, or cerebral syphilis. In films stained in Unna's polychrome blue he found various kinds of micro-organisms, including diphtheroids. In only 2 out of 21 general paralytics were organisms similar to those described by Ford Robertson found; these also were seen in a case of secondary dementia, and one of alcoholic insanity. With regard to the presence in the cerebro-spinal fluid of copper-reducing substance, he found the amount least in cases of general paralysis and greatest in alcoholic insanity. This substance, asserted at various times to be sugar, pyrocatechin, dextrose, one of the purin bases or glucosamine, was tested with Fehling's solution in 73 cases and found absent in only 2 cases which suffered from general paralysis, whereas Williamson found it absent in 14 out of 22 general paralytics. This substance disappears constantly after death, except in one case examined 4 hours post-mortem. Probably this disappearance is due to the formation of lactates in the fluid from dying nervous tissue.

## THE INFECTIVE FOCI IN GENERAL PARALYSIS AND TABES.

This paper details the further investigations of Ford Robertson.<sup>4</sup> He has devised a new medium, by pouring a few drops of sheep serum containing hæmoglobin in solution on to an agar slope. He has succeeded in growing from the nasal mucosa abundant growths of *B. paralyticans longus* and *brevis*. In 4 out of 6 cases the bacilli were virulent to mice. He finds that the nasal mucosa and subjacent tissues of the general paralytic are constantly the seat of well-marked diffuse sclerosis and localised acute and subacute inflammation. In active conditions aggregation of lymphocytes and great increase of plasma cells, with diphtheroid bacilli scattered in clumps between the epithelial cells or actively invading the tissues by penetrating the basement membrane, were seen. He has also observed microscopic ulcers whose necrotic bases contain numerous diphtheroids, similar organisms being seen in the lymphatic channels. In addition he has noted abundant aggregations of granules the size of micrococci, angular fragments, and short rods which stain of a deep blue or olive-green tint with Loeffler's blue, contained in the endothelial cells or lying free. All control cases show mast cells, and generally a few clumps of olive-green granules, but no invading diphtheroids. He has detected in several cases of general paralysis diphtheroid bacilli in the connective tissue sheath of the fifth nerve at the foramen rotundum and in the Gasserian ganglion and subjacent dura, and again in the dura under the olfactory bulb. Horizontal sections of the pia showed diphtheroids, many growing in rod forms, as the pathogenic varieties do when grown under anaerobic conditions. Clumps of "tissue granules," as seen in the nasal mucosa, are also in abundance in the pia. Experimentally these diphtheroid bacilli when injected into rabbits are taken up by endothelial cells and converted into granular aggregations very closely resembling those in the nasal mucosa and pia of general paralytics. He has been able to demonstrate diphtheroid bacilli in the brain in the majority of cases of general paralysis, even occurring locally in large numbers. In 3 cases of tabo-paralysis he has traced bacilli through the pelvic lymphatics to the posterior root ganglia and pia of the lumbo-sacral cord, accompanied by aggregation of blue granules and rods similar to those observed in nasal mucosa and cerebral pia of general paralytics. He finds that the administration of autogenous vaccines and antiserum in a fairly extensive series of cases has shown that in early cases of tabes the symptoms readily yield to this specific treatment. He believes there is sufficient evidence to show that general paralysis is a venereal disease, its bacterial infection having been produced experimentally. He describes two cases of wives suffering from endometritis in which he found a virulent diphtheroid bacillus identical with that in the nose and urethra of their



paralytic husbands. A vaccine prepared from the husband's bacillus in one case aggravated the endometritic symptoms, which in turn was obviated by the use of antiserum. He reverts once more to the previous tissue damage done by syphilis in producing a suitable soil for secondary infections by diphtheroid bacilli, which penetrate the nasal mucosa and by way of the lymphatics pass into the cranial cavity. The antecedent syphilitic injury in urethra or spinal meninges weakens the defence against secondary infections from neuro-toxic diphtheroids and other bacilli.

#### LYMPHOGENOUS INFECTION OF THE NERVOUS SYSTEM.

This subject is dealt with in a lengthy article by Orr and Rows<sup>\*</sup> on their classical experiments, which have a suggestive analogy in the pathological findings in general paralysis. The authors obtained striking results to illustrate their contention of lymphatic invasion by placing sealed celloidin capsules containing broth cultures of a micro-organism under the gluteus muscle of rabbits and dogs in contact with the sciatic nerve. Three different organisms were used, and the resulting histological changes were similar. These morbid changes are carefully described and beautifully illustrated by no less than thirty-four photo-micrographs. The evidence they produce is most convincing, and marks a great advance in the knowledge of toxic infection of the nervous system. The escaping toxins induced a very definite cellular reaction in the whole course of the sciatic nerve, through the posterior root ganglia, and along the anterior and spinal roots. The inflammatory phenomena were observed in the nerve sheaths and in the veins and capillaries outside and inside the nerve. Many important facts are brought to light. Among these they point out how plasma-cell formation becomes the most prominent indication of irritation in those regions where there is reason to presume that the toxin has been to a great extent neutralised by the reaction of the tissues. They support the view that plasma cells derive their origin from fixed tissues and not from the blood. They further corroborated the fact that "toxins experimentally introduced into animals cause the appearance of plasma cells when they give rise to subacute and chronic inflammations, but not in acute conditions." This in turn depends upon the amount and intensity of the irritating agent, fibroblasts and leucocytes making their appearance as these factors increase. The investigators clearly demonstrate that "the vascular reaction is confined to veins and capillaries, showing that the lymph spaces of the adventitial sheath of these are in direct communication with the lymphatic system of the nerve. Although doubtless the adventitial lymph system of arterioles communicates with that of the nerve, yet the intense reaction around veins and capillaries point to these as being the principal channel by which the lymph regains the general circulation."

They assert that the pathology of general paralysis can no longer be explained by such a phrase as "premature decay of the neuron," but is essentially an inflammatory process. The similarity of the perivascular changes with those of their experiments incline the authors to the opinion that the intoxication in this disease is by way of the lymphatic system. The poisoned lymph induces proliferative changes in the lymph spaces; these are reduced in efficiency and become ultimately blocked, so that a condition of "lymph block" results. This in turn aggravates the degenerative processes in the nerve cells. The causation of general paralysis would appear to be only explicable by the presence of some organism or organisms gaining access to the lymph which bathes the brain and its membranes. They state that there is a great deal of evidence to show that the "*bacillus paralyticans*" is a pathological factor of much importance, but that as exactly the same phenomena were obtained with two other organisms they cannot accept the specificity attributed to it.

#### BACTERIOLOGICAL STUDIES IN CASES OF GENERAL PARALYSIS.<sup>6</sup>

These studies have resulted in the discovery of yet another specific micro-organism by the inoculation of culture media with cerebro-spinal fluid. "From the first" these authors obtained a bacillus "in no way allied to Robertson's bacillus." It is short, 2 to  $3\mu$  long and  $.3$  to  $.5\mu$  thick, single or in pairs, end to end, and in groups, sporiferous, Gram-positive, actively motile, and with many distinctive cultural characters. Agglutination tests in 1 to 20 and 1 to 40 dilutions were positive in general paralysis and negative in controls.

From the wording of an important sentence it does not appear which of the 29 cases composed of general paralysis and other forms of insanity yielded the nine occasions on which the bacillus was isolated.

#### THE BACTERIAL INVASION OF THE BLOOD AND CEREbro-SPINAL FLUID BY WAY OF THE MESENTERIC LYMPH NODES.<sup>7</sup>

Gay and Southard give the results of their investigation in 50 cases of mental disease.

In 41 per cent. of the cases the blood cultures were sterile, similarly in 28 per cent. of the cerebro-spinal fluid. They obtained evidence of the presence of bacteriolytic substance in the blood, which was absent in the fluid. They found:—

Cocci in the blood in 26 cases, in cerebro-spinal fluid in 34 ;
Streptococci    "    "    8 times,           "    "    "    twice ;
Pneumococci   "    "    3    "           "    "    "    "
Coliaerogenes group, 11   "           "    "    "    "    7 times,

but no diphtheroids as in a former investigation.

In 10 cases showing most evidence of nerve tissue degeneration 9 showed bacillus coli in the blood, cerebro-spinal fluid, or both, in large numbers; of 31 cases of generalised softening of brain tissue, 10 yielded *B. coli*. They conclude that a definite relation must be assumed to exist between this organism and nerve-fibre degeneration. In the same paper they describe the obtaining of growths from all three regions—blood, cerebro-spinal fluid and mesenteric glands—in 55 per cent. of unselected cases of insanity, cocci being present in the blood in 20 cases, in the cerebro-spinal fluid in 22 cases, and in the lymph node in 16, and bacilli in 1, 8, and 10 cases in the respective situations. They believe that bacterial invasions are almost the rule in terminal exhaustion of the insane. They do not attach much significance to the time elapsed post-mortem since cases two hours after death yielded quite as marked results as later when somatic life had ceased.

#### GENERAL PARALYSIS AND "606."

Although scarcely time yet to decide what this substance is going to effect in general paralysis, it would appear from a survey of the published opinions that little, if any, benefit has resulted, and indeed some observers state that it is not to be expected. A still more recent form of treatment is that of Severeau, following in the lines of Marinesco, by radio-therapy.<sup>8</sup> Rays are filtered through aluminium plates to save the hair. Cure is said to result, but as there is only a modification of the lymphocytosis, it would appear to be premature to assert this claim.

REFERENCES.—<sup>1</sup> *Journ. Mental Science*, July 1910. <sup>2</sup> *Ibid.*, October 1910. <sup>3</sup> *Ibid.*, July 1910. <sup>4</sup> *Ibid.*, October 1910. <sup>5</sup> *Rev. Neur. and Psych.*, December 1910. <sup>6</sup> *New York Med. Journ.*, 22nd October 1910. <sup>7</sup> *Boston Med. and Surg. Journ.*, August 1910. <sup>8</sup> *Brit. Med. Journ.*, Epit., October 1910.

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#### DERMATOLOGY.

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and

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A "FESTSCHRIFT" to celebrate the sixtieth anniversary of Professor P. G. Unna's birthday has just been published. It consists of two large profusely-illustrated volumes of articles, on very various and interesting subjects, by friends and former pupils of Unna. The following are

abstracts of some of the articles of general interest from the first volume :—

#### UNGUENTUM TEREBINTHINÆ COMPOSITUM.

Oil of turpentine has never come to be generally used in dermatology owing to its great liability to irritate the skin. For several years past Scharff has employed oil of turpentine and its oxidation product, terebinthina (Canada balsam), in the treatment of skin diseases. He uses a paste of the following composition :—R Acid. salicylici 10 pts., ol. terebinthinæ 10-20 pts., sulph. præcip. and terebinthinæ aa 100 pts. This gives a paste which can be easily spread on the skin. Scharff says that the combination of the sulphur and the two turpentines produces a mixture which has all the properties of the turpentines without having any of their irritating effects. He uses this preparation in all follicular inflammations. In cases of widespread staphylococcal folliculitis of the limbs, where each hair follicle is the seat of a pustule, he spreads the ointment over the affected part and covers it with a muslin bandage. Three days later the bandage is removed and the area cleaned up with an antiseptic lotion. The pustules are opened with a fine-pointed cautery to allow of better penetration of the ointment, which is again applied as before. This treatment is continued for two weeks and then a sulphur zinc paste is used to complete the healing. A more rapid result can be obtained by putting a layer of some impermeable substance, *e.g.* gutta-percha tissue, on the top of the ointment.

In stubborn folliculitis and furunculosis on the back of the neck Scharff has obtained a cure in a few days by the use of this ung. terebinth. co. He has also found it good in senile warts. In hyperkeratoses and infiltrated eczemas he uses it as a preliminary treatment to soften the tissues before applying other remedies. In pityriasis versicolor he rubs it well into the parts and then applies powder on the top. One or two applications are sufficient to produce a cure. This method of application does away with the necessity of applying bandages. Similarly it can be used for the treatment of acne, but in one such case a dermatitis of the face was produced. Scharff also uses the oil of turpentine in various ointments, because by adding about 10 per cent. ol. terebinthinæ to an ung. chrysarobini or ung. pyrogall., etc., the ointment is more easily spread on the skin, and much smaller quantities are necessary than when ordinary oily vehicles are used.

#### THE ABORTIVE TREATMENT OF SYPHILIS.

Owing to the dangers which exist with the use of atoxyl and arsacetine, Hallopeau has given up using these substances in the treatment of syphilis, and employs hectine instead. Hectine—or



give it its full name, benzo-sulphone-para-amino-phenyl-arsenious acid—is a white crystalline substance which is very soluble in water and may be easily sterilised without risk of decomposition. Mouneytrat has shown by experiments on different animals that it is less toxic than atoxyl; it only contains 21 per cent. of arsenic. It is rapidly eliminated from the system, and is given in doses of from .20 to .10 cgrm. *per diem*. In such doses it has been shown after use in several hundreds of cases to have no bad effects on the eyes. Its only disadvantage is the pain which is produced by its injection. The pain lasts some hours, and is less intense if a neutral solution of the drug is used. The seat of injection shows a slight swelling and some redness for some days. In the abortive treatment of syphilis Hallopeau does not rely on hectine alone, he gives a daily injection of the following solution:—

R Hectine, .20 cgrm.  
 Novocaine,  $\frac{1}{100}$  gm.  
 Aq. destillat., 2 c.c.

This solution is injected either directly into the hard chancre itself or into its immediate neighbourhood, or into the area between the primary sore and the nearest lymphatic glands. The primary sore is rubbed daily with a 10 per cent. ointment of hectine. The patient also receives general treatment with daily injections of .02 cgrm. of benzoate of mercury, and with the administration of potass. iodid. by the mouth. Hallopeau has been induced to use this rather complicated method of treatment because before the secondary eruption appears the disease is almost exclusively local in the primary sore, the lymphatics which lead from it, and the adjacent glands, and only very few spirochætæ are found in the circulating blood. The fact that in this stage such persons are immune to a fresh inoculation with syphilis is due to the passage of toxins from the primary lesion into the general circulation.

By this method of treatment 142 cures in the primary stage have been reported by Hallopeau, Mariotti, Fouquet, and Moniz. In one of Hallopeau's cases some sloughing was produced at the seat of injection of the hectine. He explains this as probably due to the rubbing of the parts by the clothes whilst the patient was at his work.

Hallopeau also recommends the method as a preventive treatment against syphilis in persons who have been exposed to infection.

#### THE ETIOLOGY OF ACNE.

The comedo is the characteristic lesion in acne vulgaris. If it be examined microscopically, three kinds of organisms are invariably found—(1) the so-called bottle bacillus; (2) a small bacillus; (3) a coccus. These bottle bacilli or spores of Malassez are large organisms, and are

found on the scalp in great abundance in seborrhœa capitis, and most observers consider them as saprophytes.

The small bacillus found in acne (the micro-bacillus of Unna) is considered by some as the causal organism, but many hold that this is the same organism as the seborrhœa bacillus found on the scalp, and that it is a fat-saprophyte growing in the follicles. The third organism, viz. the coccus, is the one which Beek considers as the cause of acne. That observer states that the suppuration seen in acne is an endo-folliculitis and not a peri-folliculitis, such as is seen in a folliculitis due to the staphylococcus pyogenes. These pustules are also not so inflamed as in staphylococcal infections, and they do not go on to the formation of furuncles. Lomry made cultures from acne pustules and obtained a coccus which he considers a very non-virulent form of the ordinary staphylococcus aureus and albus. Unna, on the other hand, holds that the coccus in acne is a specific organism not in any way related to the staphylococcus. It gives a pure white culture.

Frau Dr. Schwenter-Trachsler has endeavoured to bring forward further proofs (1) that this coccus which is found in the comedo is not the staphylococcus albus, and (2) that it is the cause of acne.

Cultures were made from acne cases and a growth obtained which was pure white and never showed any tendency to turn yellow. It also did not liquefy gelatine, as the staphylococcus does. This observer therefore concludes that this coccus is not the staphylococcus albus.

She also took a pure culture of this coccus and rubbed it on the forehead of a healthy girl of 14 years of age. The next day there was slight redness of the skin, but that disappeared soon. After ten days the pores of the infected area showed a distinct dilatation, and after three weeks comedones appeared. These comedones only appeared on the part of the skin where the culture had been rubbed. From these comedones cultures were made, and a pure white growth the same as the original culture obtained; therefore she concludes that this coccus, which she obtained from acne comedones and pustules, is the cause of acne.

#### ERYTHEMA MYCOTICUM INFANTILE.

All practitioners are aware of the difficulty which there is in diagnosing skin eruptions in young infants. The infant's skin differs from the adult's in being thinner and softer. The majority of superficial eruptions show a marked tendency to become generalised very rapidly, and so the original character of the lesion is soon masked. The ordinary erythema gluteale (dermatitis infantilis simplex) of infants is well known, and is the form of eruption on the buttocks associated with intestinal disturbances, but the eruption on the buttocks of infants first clearly defined by Jacquet as erythema papulatum is less well known. This eruption may occur in an erythematous, vesicular,

pustular, or ulcerated form. Many years ago Parrot described such lesions as due to congenital syphilis, but they have no connection with that disease. Besides the form of eruption just mentioned, Jacquet has described a special kind which he calls dermatitis erythematosquamosa. Beck has noticed this form of eruption on several infants. It occurs on the buttocks of infants who show no signs of intestinal disturbances. It occurs in the first few weeks of life, usually at the age of from three weeks to two months, and must be clearly distinguished from the simple erythema gluteale. The eruption begins as small red spots, in the centre of which a small scale soon appears. The spots soon increase in size and run together to form patches over the whole gluteal region, adjacent thighs, and lower part of back. The edge of the lesion is fairly sharply marked, but does not feel thickened. It tends to heal in the centre and spread at the edge, and that gave rise for a long time to its being considered a syphilitic lesion. After some time the skin becomes redder, shining, and slightly swollen, so that the condition is very difficult to distinguish from intertrigo or seborrhœic dermatitis, but by examining scales from such cases in caustic potash Beck found that a fungus was present. This fungus consists of long threads of mycelium and collections of roundish spores not unlike those seen in pityriasis versicolor, but the elements are larger. Beck considers the fungus to be the cause of erythema squamosum of infants. He has always found it in such cases, and although careful search was made in intertrigo, etc., no fungus was found in these conditions; therefore Beck suggests that the disease should be called Erythema Mycoticum Infantile. Beck also made cultures from the skin in these cases and obtained a growth of a fungus which showed some resemblance to the *oidium albicans* which produces thrush in the mouths of infants. It also has some characters in common with a fungus described by Küster in a case of ringworm which occurred in a patient who was kept in a continuous bath. Further observations will have to be made before the exact nature of the fungus can be determined.

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## NEW BOOKS AND NEW EDITIONS.

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*Ophthalmic Surgery.* By CHARLES H. BEARD, M.D., Surgeon to the Illinois Charitable Eye and Ear Infirmary, etc. London: Rebman, Ltd. 1910. Price 22s. net.

THIS book is the outcome of twenty-six years of experience, begun under Agnew and Knapp in New York, continued in England and the Continent, and gained chiefly in America. The work is profusely illustrated by drawings chiefly from the author's own pen, and, on the whole, may be regarded as a decided success.

Chapter I. is devoted to the para-operative technique, and contains important information, including the preparation of the patient, the surgeon's hands, operating-room, dressings and bandages. The application of cold and heat as therapeutic agents, tissue injections, and blood-letting, are all discussed and sufficiently dealt with. Chapter II. gives detailed instructions regarding instruments and their management, much useful information being given. Chapter III. deals with operations on the appendages of the eye, *e.g.* probing and syringing of the tear ducts, dividing the canaliculi, and extirpation of the lachrymal sac and glands. Operations on the extrinsic muscles of the eyeball for the various forms of strabismus find a place in Chapter IV. The description of each operation is so clearly given that the beginner will have no difficulty in following with comparatively little effort the details of each. The illustrations in this chapter will be found most helpful.

Operations on the eyelids are next dealt with. Agnew's marginal route in operating on chalazia is needlessly vaunted by the author, the objections raised, especially to the conjunctival route, being in our experience fanciful. Beard's forceps is recommended for steadying the eyelid while an intermarginal incision is being made in lid operations, but we know of no advantage it possesses over that of Snellen's or Knapp's. Indeed, throughout the book there is a tendency to press the claims of the author's own instruments and his modifications of certain well-known operations, which in a text-book is objectionable.

Forty-nine pages are devoted to conjunctival operations, each operation receiving adequate treatment.

Operations on the eyeball find prominence, as might be expected in a treatise such as this, the various steps of the most important ones being well described and beautifully illustrated. In passing, we might draw attention to the objectionable practice of the wearing of a ring by the surgeon while operating, as illustrated in these pages.

In cataract operations the author insists on the first dressing being done after forty-eight hours, no matter how favourable the progress of the case. If an operation has been performed properly and aseptically, and the toilet of the wound carefully attended to, there is no need of changing the first dressing for a week, provided the dressing remains *in situ* and no discomfort is complained of—the less interference the better in operations on the eyeball.

The methods for removal of foreign bodies from the interior of the eyeball are given in the final chapter, the relative merits of the giant and hand magnets being discussed with fairness.

Taking this book as a whole, we have no hesitation in saying that it is a distinct and valuable addition to ophthalmic literature, and, but for the frequent Americanisms met with and typographical errors, which can be remedied in a second edition, we can confidently recommend it as a sound and reliable guide to the operative technique of the eye.



*The Hygiene of Infancy and Childhood and the Underlying Factors of Disease.*

By A. DINGWALL FORDYCE, M.D., F.R.C.P.(Edin.). Pp. 288.

Edinburgh: E. & S. Livingstone. 1910. Price 6s.

THE reputation of the Edinburgh Medical School in connection with the study of disease in children is well known, and the tradition is apparently going to be maintained by the younger generation. The title of the latest work on this subject is sufficiently long, but yet it fails to convey exactly what is the purpose of the author. For that we turn to the preface, in which he states that a work is lacking which correlates the primary scientific facts of medicine as they apply specially to pædiatrics. Amongst these scientific branches of medicine he includes physiology, pathology, bacteriology, and heredity, and he has sections on various other factors, such as food, environment, and age-period. The treatise is not in any sense a medical text-book, but it is offered as the modern basis of clinical pædiatrics.

The section on the food factor deals at considerable length with the nature of foods and metabolism in a manner which would serve equally well for any age. The devotion of so much space to this subject is to be regretted, because it has apparently led to the curtailing of the subsequent chapters on Feeding in Health, and the Digestive and Metabolic Disorders of Early Life. This section might with benefit have been considerably reduced in its earlier portion, and considerably expanded in its later part.

The subject of heredity is touched on briefly, and the aim of the author is evidently to give his readers an epitome of recent views on this question. The chapter on Environment is a short one, and is composed chiefly of quotations drawn from many sources. Clouston, Herbert Spencer, H. G. Wells, and others are drawn on. In describing the section on the bacterial factor as one of the best in the book we have again to protest against the first twenty-two pages being devoted to a description of bacterial infection in general, vaccines, opsonic index, etc. When the author comes to his subject proper, the peculiarities of bacterial infection in childhood, he gives a most interesting account of this important factor in disease. He does not deal with the treatment of these affections, but shows how widely spread bacterial infection is in the young, and how important its recognition is in connection with the diseases of children. In the last section on the factor of age-period the author deals with the various characteristics—mental, moral, and physical—of early life, and the various affections to which the developing body is specially liable as the months and years pass on.

We have read this book with pleasure. It is the work of a thoughtful writer, who takes no narrow view of the study of disease in children. Every section bears evidence of Dr. Fordyce's extensive

reading on all cognate subjects, but sometimes the latest views are quoted as authoritative statements when they have scarcely yet passed the bar of public criticism.

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*Mentally Deficient Children: Their Treatment and Nursing.* By G. E. SHUTTLEWORTH, M.D., and W. A. POTTS, M.D. Third Edition. Pp. xviii. + 236. London: H. K. Lewis. 1910. Price 5s. net.

THE plan of this new edition of Dr. Shuttleworth's book does not differ materially from that of its predecessors. The educational and institutional aspects of mental defect are dealt with more fully than the clinical side, and for this reason the book will appeal to educationalists and those interested in the philanthropic aspects of mental defect as well as to medical men, for whom the volume is primarily intended. At the same time, we would have welcomed a fuller account of the clinical symptoms of imbecility, because during infancy and the earlier years of life cases of this kind are necessarily treated at home, and at present, unfortunately, receive too little attention from the family doctor. The diagnosis of mental defect during the first few weeks or months of life is difficult, but not always impossible; it is extremely important from the practical physician's point of view, and might with advantage have been more fully gone into. In the same way, the varieties of syphilitic dementia form a most interesting group, and the practical importance of recognising them arises from the fact that most of them deteriorate very rapidly—a prognosis which has considerable bearing on the treatment to be advised—yet they do not receive any very detailed description. The book gives an excellent epitome of administrative control of the feeble-minded, and of educational methods, and will be found a useful guide on these and cognate matters. There are a number of good illustrations, among which we would especially refer to those of oxycephaly as of particular interest.

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*Hydrotherapy.* By GUY HINSDALE, A.M., M.D., Lecturer on Climatology in the Medico-Chirurgical College of Philadelphia. Pp. 466. Philadelphia and London: W. B. Saunders Company. 1910. Price 15s.

THIS is a thorough and detailed presentation of the subject of hydrotherapy. The book is divided into four sections. The first, dealing with the subject in general, endeavours to lay the physiological basis for the benefits derived from the external application of water, and discusses the reputed differences between saline and fresh-water baths. The second is devoted to special hydrotherapy, and, under a very lengthy list of diseases, which is almost a complete catalogue of human

pathology, gives the various hydropathic measures suitable for each. In the third section the technique of the various forms of hydropathic treatment is fully dealt with, and the text is further assisted by a generous use of illustrations. The last section is on the use of mineral waters externally, a subject which is termed crounotherapy or crenology.

The author shows a thorough command of his subject, both in its practical aspects and also in the vast literature which has accumulated round a remedial agency of so ancient a date. Though an enthusiastic advocate, his discussion of the rationale of hydrotherapy is sound and moderate. After a careful review of the evidence he concludes that the absorption of mineral constituents through the unbroken skin is a negligible factor in the therapeutic value of baths, and that the benefits derived are due to alterations in the circulation effected by the varied use of heat, cold, and pressure. The very numerous references to authorities and special papers, the minuteness of the practical directions, and the great number of illustrations make the book one of great value either for the purpose of casual reference or for a complete study of the subject. It is almost inevitable that such an exclusive absorption in hydrotherapy should lead to a loss of proportion at times. But it is hardly necessary to utter a warning against occasional extravagances of statement. Those who are accustomed to use all the weapons which the art of healing offers will be hardly disposed to agree with the author's sanguine forecast of the day when hydrotherapy will take the foremost place in therapeutics.

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*The Medical Complications, Accidents, and Sequels of Typhoid Fever and the other Erythematosa.* By HOBART AMORY HARE, M.D., B.Sc., and E. J. G. BEARDSLEY, M.D., L.R.C.P. Second Edition. With 26 Illustrations and 2 Plates. Pp. 406. Philadelphia and New York. Lea and Febiger.

DR. HARE'S book on the *Medical Complications of Typhoid Fever* is already well known, and forms an admirable companion to Professor Keen's work on the surgical interests of the same fever. In this new edition Dr. Hare has, with the help of Dr. Beardsley, added very largely to the subject-matter of the volume by including chapters on the other eruptive fevers. We are glad to see that Dr. Dercum's admirable chapter on the Mental Complications and Sequelæ of the Disease is still retained.

The large amount of literature which has appeared on the subject during the last ten years must have made the task of the authors a difficult one, and they are to be congratulated on summarising clearly and succinctly an extraordinary amount of interesting matter. But

their book is no mere compilation, as they have brought their own experience to bear upon the subjects under discussion, and report many interesting cases of their own. While their main idea is to deal merely with complications and sequelæ, they discuss also the conditions liable to be confused with typhoid fever and thus touch upon the question of diagnosis. Again, regarding as they do the ordinary accidents of the disease, such as hæmorrhage and diarrhœa for example, as within the scope of their subject, they leave but little connected with typhoid fever, except, indeed, treatment, untouched.

The main value of the volume, however, will be as a work of reference for those interested in the more out-of-the-way complications of typhoid fever and the exanthemata. Here is to be found tabulated all the recent literature, well arranged and judiciously annotated, with all the references carefully given. The book is attractively got up and well illustrated with charts, and we cordially recommend it to those whose work brings them into contact with the group of diseases treated.

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*Anæmia.* By Dr. P. EHRLICH and Dr. A. LAZARUS. Second Edition.  
By Dr. A. LAZARUS and Dr. O. NÆGELI. Translated from  
the German by H. W. ARMIT, M.R.C.S., L.R.C.P.(Lond.).  
Pp. 218. With 5 Illustrations in the Text and 5 Coloured  
Plates. London: Rebman, Ltd. 1910.

It is gratifying to have in an English dress the second edition of this well-known work. The translation has been done admirably, and gives in good English the whole sense of the German original. The book is one which is too well known to need a complete review, but, while the second edition has been brought as nearly up to date as any hæmatological text-book can be, it suffers from the faults of the first edition, if one regards it from one point of view, or its advantages from another. The main fault, from the point of view of the beginner, is that too much theoretical and technical knowledge is presupposed, and that the description of the methods is sketchy and inexact. The whole tendency of the book is to be chatty and discursive, and it does not read in the least like a text-book. On the other hand, from the point of view of the hæmatologist, this is an advantage, and although Ehrlich is no longer formally connected with it, his opinions dominate throughout the views which are enunciated. In some points they have been altered since the first edition was published, in others Ehrlich has seen views, which he formerly championed alone, come to be widely accepted as the result of further work. The one unsatisfactory part of the volume before us is the illustrations. These are practically all done from specimens made with the Giemsa stain. Fortunately this stain is little in use for blood work in this country,



as it is probably the least suitable of all the Romanovsky methods for that purpose. The figures do not give good pictures of the different cells, and it would have been much better had the figures been drawn from Jenner, Wright, or even triacid specimens.

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*The Cancer Problem: A Statistical Study.* By C. E. GREEN, F.R.S.E.  
Pp. 90, with Illustrations. Edinburgh: William Green & Sons.  
1911.

THE author of this little work is a man of great originality and untiring industry. He has been working at the origin and treatment of cancer, and in this work makes excellent use of statistical methods—by which he tries to obtain light on what he calls the crux of the question, the occupational incidence and the local incidence, finishing with a suggested explanation and a question as to the curability of cancer. The statistics obtained from the returns of the Registrar-General are very remarkable, the mortality in certain places being 9, in others 1·5. Mr. Green has made tables which he thinks prove that the extreme variation has a relation to the physical geography of the different parts. He also discusses the other tables which show the enormous differences either produced by or related to occupation, from the 156 of the chimney sweep to the 33 of the tanner. Considering that Mr. Green is not a medical man, his comments on these facts are most sensible. In the chapter on the cure of cancer, he modestly suggests that the free use of calcium internally and hot water externally may be useful. We welcome this little book, and would encourage Mr. Green to persevere in this kind of work. He has been all over Scotland inspecting the places where cancer is frequent, as well as those where it is hardly known. He has done, and is still doing good work by inspecting cancer houses. All facts in relation to this fell disease will be welcomed by scientific observers, and if hard work and patience can verify the facts, Mr. Green will not fail us.

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*The Diseases of the Nose, Mouth, Pharynx, and Larynx: A Text-Book for Students and Practitioners of Medicine.* By Dr. ALFRED BRUCK (Berlin). Edited and translated by F. W. FORBES ROSS, M.D. (Edin.), F.R.C.S.(Eng.); assisted by FRIEDRICH GANS, M.D.  
Pp. 615. London: Rebman, Ltd. 1910.

THE author of this book has been successful in producing a volume which, while easily read and not crowded with detail, is well arranged and comprehensive. The sketch of the anatomy which introduces each of the four sections indicated by the title is calculated to give the reader a clear idea of the relationships of the parts without weary-

ing him with unimportant minutiae. The section on diseases of the mouth should prove particularly useful to the general practitioner, containing as it does a classification and description of diseases which are not often so well grouped together, and which are continually coming under his notice. Among the illustrations, which on the whole are clear and accurate, surgical instruments do not figure too largely, as they are apt to do in works of this nature.

The translators state in their preface that they "have endeavored as much as possible to follow closely the German text, even at the risk of not producing 'classical English' at the expense of the exact 'shade of meaning' or sense which the author originally endeavored to convey." It is a pity that they have carried this principle so far, for it seems to us that in a serious text-book nothing can excuse such passages as occur, for example, on page 365, where we are told that "it is not good practice to allow the patient to hold their own tongues during the first examination;" or, again, on page 351, where it is stated that "behind this muscle the fibers of the m. arytenoideus obliquus, shortly called 'obliquus,' cross obliquely, and which arise on both sides from the muscular processes of the arytenoid cartilage."

The work, though containing few new features of importance, except, perhaps, the special section on the diseases of the mouth, should form a useful addition to the literature of the subject.

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*A Text Book of Pharmacology and Therapeutics, or the Action of Drugs in Health and Disease.* By ARTHUR R. CUSHNY, M.A., M.D., F.R.S. Fifth Edition, thoroughly revised. Pp. 744. London: J. & A. Churchill. 1910. Price 15s.

WE gladly welcome the fifth edition of what must be regarded as the standard work on pharmacology in the English language. The book is so well known that it needs no commendation in these pages. The present edition is considerably enlarged and numerous illustrations have been added; the whole has been carefully revised and the literature brought up to date. The practitioner will read with interest the account of the recent work on ergot, of which the teaching was, till lately, so chaotic. Advance in the knowledge of cardiac disease has necessitated reconsideration of the action of digitalis, while the study of protozoal infections has suggested new points of view in regard to specific remedies, such as arsenic and mercury. All these will be found fully considered in the present volume. Recent pharmacological work had seemed to show that tobacco smoking, by raising blood-pressure, might favour arterio-sclerosis; many will gladly note that the author considers the rise of blood-pressure is so slight that such a fear is groundless. We most heartily commend the volume to the consideration of practitioners and students.

# EDINBURGH MEDICAL JOURNAL.

## EDITORIAL NOTES AND NEWS.

THE notice by the *Scotsman* of Dr. Joseph Bell's sudden illness three weeks ago sent many inquirers round to Melville Crescent. We are glad to learn that he is now making satisfactory progress.

PRESENTATION OF PORTRAIT  
to Emeritus-Professor  
Chiene, C.B.

WHEN Professor Chiene retired from the Chair of Surgery, which he had occupied with such distinction for a period of twenty-seven years, his friends felt that the occasion should be seized to manifest the esteem and affection in which he is held, and this desire took concrete form last month, when Lord Ardwall, in the name of nearly four hundred subscribers, handed over to Mr. Chiene his portrait, painted by Mr. Fiddes Watt.

So spontaneous and whole-hearted has been the response to the efforts of the committee who carried through the proposal that Principal Sir William Turner, who presided at the presentation ceremony, had the satisfaction of announcing that the surplus funds at the disposal of the committee had been sufficient to enable them to institute a "Chiene Medal for Excellence in Surgery," and that the recipient of this medal would, in addition, be awarded a sum of money as part of the prize.

We desire to add our congratulations to Mr. Chiene on this memorable occasion, and to associate ourselves with the tributes which were so eloquently paid by Lord Ardwall and Sir William Turner to his work and worth as a surgeon, a teacher, and a man.

Valuable as Mr. Chiene's contributions to the science and art of surgery have been, it is as a teacher of surgery that his name will go down to posterity, and we believe he would wish it so. He was a great teacher. His methods were his own, and were to such an extent the outcome of his strong individuality and force of character that they could not be effectively copied. The lessons he taught left a deep and lasting impression on his pupils, and scattered throughout the world are men who daily recall his terse and homely dicta, and who base their surgical practice on the broad general principles he so forcibly instilled into them in the wards of the Royal Infirmary. His numerous pupils

who in turn became teachers were, it may be unconsciously, but none the less strongly, influenced by his sincerity of purpose, his breadth of view, and his sound common sense.

We have no information as to the conditions under which the "Chiene Medal" will be awarded, but we would venture to express the hope that it may be utilised to encourage young graduates who have shown such capacity for original work and ability to inform others as will make it a fitting memorial to John Chiene.

Presentation to Dr.  
William Craig.

THE Edinburgh Obstetrical Society met at dinner on 8th February to do honour to Dr. William Craig on the occasion of his retiral from the treasurership. Dr. Craig held the office for thirty-five years, and during his long tenure by his enthusiasm and financial ability he raised the Society from the verge of bankruptcy to its present flourishing condition. His name is indissolubly connected with the annual publication of the *Transactions* and their free transmission to the fellows of the Society throughout the world.

At the complimentary dinner Dr. Craig was presented with a service of plate to mark the Society's esteem and gratitude. The presentation was made by Sir Alexander R. Simpson, whose long and active association with the Society eminently fitted him to apprise the high value of Dr. Craig's services.

Royal Medical Society.

To Edinburgh men there are few memories more pleasant than those associated with their active membership of the Royal Medical Society. Its long history, its great traditions, and the lustre shed on its roll by such names as William Cullen, Joseph Black, Haller, the Monros, Oliver Goldsmith, Mark Akenside, Mungo Park, Sir Charles Hastings, Thomas Addison, Charles Darwin, and Joseph Lister, to mention only a few of its distinguished members, give to the Royal Medical a unique position among students' societies. Not the least interesting event in the Society's proceedings is the Presidents' Dinner. This function was held in the hall of the Society on February 15th, when Sir James Crichton Browne was the guest of the presidents. In proposing the health of the guest, the senior President, Dr. Francis R. Fraser, mentioned the interesting fact that exactly half a century ago James Crichton Browne occupied the presidential chair, his colleagues being Alexander Crum Brown, William W. Watson, and James Pettigrew. In a characteristically racy and eloquent speech, Sir James recalled many episodes of his student days, and took the opportunity of drawing attention to the fact that in the writings of his co-president, James Pettigrew, is to be found one of the first and best scientific expositions of the principles underlying the art of aviation.



Sir Robert B. Finlay, M.P., also a former president of the Society, was prevented by his parliamentary duties from being present as a guest of the presidents.

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THE "Lay Sermon" which Professor Osler preached in the M'Ewan Hall last July was well worth preserving upon the printed page as well as in the fictile brains of the students who were privileged to hear it. The occasion was the Prevention of Tuberculosis Conference, one among several conferences which tended to make the summer of 1910 memorable in Edinburgh. *Man's Redemption of Man*<sup>1</sup> was the medical preacher's subject, and the "gospel of the body" was preached with all Professor Osler's force, persuasion, and passion. Touching in turn upon anaesthesia, asepsis in surgery, vaccination for smallpox, Koch and cholera, the stamping out of yellow fever, the fighting of plague, the extermination of the mosquito and of malaria with it, the Oxford professor showed, as in a series of kinematographic views, the "fairytale of science and the long result of time." And it is a wonderful gospel, this of the body, albeit the redemption wrought is not yet full and free; for tuberculosis looms gaunt and grim and cancer calls loudly for a cure. There are other secrets yet to be "wrung from Nature's close reserve," as Browning has it, before the complete gospel of the body can be carried over land and sea, for the healing of the nations. "Science moves, but slowly, slowly, creeping on from point to point, and yet throughout the whole of Professor Osler's address we seem to hear "the voice of them that shout for mastery" and the far-off clarion note of victory.

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The Morningside  
Report.

DR. CLOUSTON's reports were always looked forward to and read with interest by lay and medical man alike, and his successor's promise to maintain the interest.

Dr. Robertson's report is coloured by an optimism and lighted with a humour which is quite refreshing.

His experience shows that the combination of hard times and increased spirit duty has produced the lowest rate of alcoholic insanity *in males* that has yet been recorded in Morningside, and it is further interesting to learn that the improvement in trade has not been followed by any rise in the rate. It is therefore the more regrettable that he has to chronicle a steady increase, during his tenure of office, of alcoholic insanity among women, and he commends this matter to the serious consideration of social workers.

A distinguished statesman once declared that his opponents had ransacked the lunatic asylums for peers to vote against a certain

<sup>1</sup> *Man's Redemption of Man*, by William Osler, London: Constable & Co., Ltd., 1910, price 1s. net.

measure, but Dr. Robertson discloses the fact that such voting is not confined to the House of Lords. Two of his patients "asked out" to vote, and his only consolation is that they both voted for unsuccessful candidates. Politicians will draw what moral they please from Dr. Robertson's experience that in Edinburgh no one went mad over the two general elections.

The most interesting medical records are those of a patient suffering from hyperthyroidism who recovered under injections of the serum of a thyroidectomised goat, and another who, after an injection of Salvarsan, "made almost at once the best apparent recovery of any case of undoubted general paralysis I have yet seen." Two months have elapsed since the injection, and the patient still keeps well.

The nursing and general conduct of the asylum are continued successfully on those free and fresh air lines which Dr. Robertson so eloquently advocates, and he has his usual good word to say of the suitability of lady doctors for research work.

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**The Price of a Pound  
of Flesh.**

MUNICIPAL Court Justice Davies was recently called upon to decide, as in the case of "The Merchant of Venice," upon the commercial value of a pound of flesh. A certain Harlem practitioner had brought suit for the collection of a bill, one item of which was "\$14 for the removal of fourteen pounds of excess avoirdupois tissue." After the hearing of the case the magistrate decided that the rate of \$1 a pound was fair. As some of the patient's surplus flesh had come back, however, this was considered a complicating circumstance, and accordingly the doctor was asked if it was his custom to grant rebates if the fat came back. "In that case," the Court went on to say, "I will allow a leeway of two pounds, and award you a decision of \$12, which is your normal rate with a margin for debatable differences" (*Boston Med. and Surg. Journ.*).

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**Appointments.**

DR. J. H. HARVEY PIRIE has been appointed Assistant Pathologist to the Royal Infirmary. The following appointments have been made to the staff of Leith Hospital:—Dr. G. D. Mathewson to be Assistant Physician; Dr. Thomas Addis to be Medical Registrar; Dr. H. Torrance Thomson to be Hon. Anæsthetist.

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ARTERIAL PRESSURE.<sup>1</sup>

By G. A. GIBSON, M.D., LL.D., F.R.C.P.,  
Physician to the Royal Infirmary.

My first duty is to express my great pleasure in having this opportunity of bringing before the Society some of the important facts relating to arterial pressure as an introduction to what, it is hoped, will be an interesting discussion. My original intention, when speaking to the Senior Secretary on the subject, was simply to bring a paper before you dealing with certain aspects of the subject which have been, during the last few years more especially, occupying my attention: but it will certainly be more interesting to us all to have an open discussion of the subject at large.

*Definition of Terms.*—Before entering upon the consideration of the different divisions into which the subject naturally falls, it is obvious that we must be at one in regard to the terminology to be employed. The *maximal*, or *systolic*, *pressure* is estimated by the amount of force which will entirely arrest the flow of blood in the vessel undergoing investigation. In regard to this point there is probably no difference of opinion whatsoever, except with reference to the relative importance of the resistance offered by the wall of the vessel—a matter which will engage our attention shortly. The *minimal*, or *diastolic*, *pressure* is estimated by the point at which the greatest lateral oscillation of the arterial walls is found. This is ascertained by the level at which the greatest systolic and diastolic movements of the column of mercury are observed. This part of the subject has given rise to more difficulty than any other in the study of arterial pressure, and has led to wider discrepancies of opinion. Marey, for example, regarded the greatest oscillations as being an expression of the mean pressure. In this belief he was followed by Hill and Barnard, who expressed a similar opinion, but since the investigations of Howell and Brush we know that the greatest oscillations are found to indicate the diastolic pressure, their careful investigation having absolutely proved this point. The *mean pressure* is taken to be a point half-way between the maximal and minimal, while the *pulse pressure* is a term employed to

<sup>1</sup> The introduction to a discussion at the Medico-Chirurgical Society, 30th November 1910.

denote the amount of difference between the maximal and minimal pressures. The use of this latter term—*pulse pressure*—cannot be commended, as it savours of ambiguity. The term, however, has become implanted in modern literature, and when that is the case it is difficult to modify use and wont.

The arterial pressure, as measured by our clinical methods, is the *lateral* pressure, or the pressure which is exerted on the walls of the vessels at a right angle, approximately, to the line in which the onward current of blood flows. The *terminal* pressure may be regarded as this lateral pressure, in addition to the velocity of the blood. The general conception is that the lateral pressure in an artery is about equal to the terminal pressure in the branch of the vessel immediately beyond the point at which the lateral pressure is estimated.

In the discussion of various problems connected with arterial pressure it is useful to take into consideration the *co-efficient* of pressure, as it provides us with a convenient method of estimating the validity of the circulation. The co-efficient of pressure consists in the pulse pressure, divided by the systolic pressure. Dealing with anyone in ordinary health, we may say (expressing the pressure in millimetres of mercury) the systolic pressure is 120, the diastolic pressure is 90, and the pulse pressure is 30. This gives us:—

$$\frac{\text{P.P.}}{\text{S.P.}} = \frac{30}{120} = \frac{1}{4}$$

which is the co-efficient of pressure. We may further assume that the pulse pressure, multiplied by the pulse-rate, is equivalent to the *velocity*; while the systolic pressure, multiplied by the pulse-rate, expresses the *work done*. From this it is easy to calculate the efficiency of the heart. For anyone in perfect health, in formulæ similar to those of Tigerstedt and Hirschfelder, we may state the condition of matters in the following way:—

$$\frac{\text{P.P.} \times \text{P.R.}}{\text{S.P.} \times \text{P.R.}} = \frac{\text{Velocity}}{\text{Work}} = \frac{30 \times 70}{120 \times 70} = \frac{2100}{8400} = \frac{1}{4}$$

which gives the efficiency of the heart in health.

Let me, as a contrast to this, state what may occur in an instance of heart block:—

$$\text{S.P.} = 270; \text{D.P.} = 90; \text{P.P.} = 180; \text{P.R.} = 30 \quad \frac{180 \times 30}{270 \times 30} = \frac{5400}{8100} = \frac{2}{3}$$



In a case of aortic disease the departure from normal may be even greater:—

$$\text{S.P.} = 160; \text{D.P.} = 80; \text{P.P.} = 80; \text{P.R.} = 90 \quad \frac{80 \times 90}{160 \times 90} = \frac{7200}{14400} = \frac{1}{2}$$

*Influences at Work.*—The factors which maintain the arterial pressure must be briefly referred to. The first and greatest influence is the *energy of the heart*. Although many other causes are in operation in the maintenance of the arterial pressure, this is the most important. The heart still remains, as Harvey said, “the Sun of the Microcosm.” If, for any reason, there should be an increased output of energy in the heart, the arterial pressure is augmented; and if, on the other hand, there should be diminished cardiac energy, the arterial pressure will necessarily fall, other conditions remaining constant.

The condition of the *arterial walls* plays a prominent part in the maintenance of the pressure. When the arterial walls are in conditions of health, so as to permit of the uninterrupted passage of the wave of increased pressure produced by cardiac activity, and when the walls retain their power of *elasticity* (meaning the property by means of which, after any change of form, they return to their previous condition) the state of matters is most favourable for the circulation. With every pulsation of the heart there is a corresponding increase of pressure within the arteries, and some of this pressure distends the arteries, giving rise to potential energy which, during cardiac diastole, becomes kinetic. There has been a considerable amount of misconception as regards the condition of the arterial walls. In the first place, the term elasticity has been used with very different conceptions, but, taking it in the sense employed by Kelvin and Tait, we may hold that it is the property by means of which a body that has been distorted by any force returns to its original bulk and shape on the removal of that force. In the second place, the *resistance* of the arteries to external pressure has been the subject of considerable debate within recent years. According to many authorities, as may be found expressed by Janeway, the resistance of the arterial walls to external pressure may be regarded as a negligible quantity; while, according to others (and here Russell may be regarded as the protagonist) the external resistance of the arteries is the most important factor in arterial pressure, as gauged by clinical methods. Here, as in many other matters, the truth lies somewhere between the two extremes, but it is certainly nearer the statement of Janeway

than of Russell. The question can easily be solved by testing the resistance of the arteries by the methods employed by Tait in the investigation of distensible tubes. A piece of the brachial artery (which is specially selected seeing that it is the artery in which we estimate arterial pressure most commonly) is tied at its two ends to two pieces of glass tubing, and fixed, by means of these, inside a glass tube, with rubber stoppers at each end, through which the two pieces of glass tubing are inserted. By means of two other glass tubes a stream of water is caused to flow from a reservoir, while another stream of water is led through the artery. Each system, internal and external, is in communication with a mercurial manometer, and when water is allowed to flow through the two systems, the amount of resistance required to compress the artery can be accurately determined. In my own observations the amount of arterial resistance ascertained in this way has never exceeded 15 mm. Hg, but in the series of 49 cases carefully studied by Herringham and Womack they found two instances in which the pressure was above 30; one of these gave 33, and the other 34 mm. Hg. With these two exceptions, in no case was the obliterating pressure above 24 mm. Hg. It may be held that experiments upon arteries after death do not help us as regards sphygmomanometric investigations during life, but it is to be remembered that the tonus of the vessels does not cease at the moment of death; on the contrary, it remains for a variable period.

The *resistance in the arterioles* is, next to the cardiac energy, the most important factor in the production of arterial pressure; in fact, the resistance and the pressure are reciprocal. The resistance in the arteries is produced by tonus, which is the result of the antagonistic action of vasoconstrictor and vasodilator nerves. There is a great difference between the action of these two sets of nerves; the former are constantly in action, the latter are only brought into action when they are required. These agencies are always in a condition of variation, so that the general and local vasomotor tone may be regarded as perpetually undergoing alterations.

The *character of the blood* undoubtedly plays a prominent part in the arterial pressure. The *density* appears to me to be in a direct ratio to the pressure. The few observations which have been made by myself personally have been with the view of illustrating the condition of matters in splenomegalic polycythæmia. These observations have led me to the belief that the

specific gravity and the pressure bear a direct ratio to each other. This appears to be the general conclusion of most observers. The *viscosity* of the blood might be thought to stand in the same relation as the density, and here again the few individual observations made by myself would lead me to that belief. A much larger series of investigations, carried out by Welsh at my suggestion, and shortly to be published, throws considerable doubt upon this matter, and it is one which will require careful investigation in the future. The presence of *chemical impurities* in the blood increases, for the most part, the pressure, but certain impurities bring about the opposite result. Whether these effects are the result of direct toxic blood on the arterioles or on their nerves is at present uncertain. The *quantity* of the blood in the circulatory organs must have some influence, and it might naturally be expected that increased volume would result in higher pressure. The vasomotor nervous system, however, has such ample powers of compensation that the quantity of the blood in itself has not, probably, such influence.

The local condition of arterial pressure in any part of the body is not merely modified by vasomotor activity, but also by mechanical interference. In other words, alterations in the *access of blood* bring about modifications in local pressure. It has long been known that any obstruction increases the proximal and lessens the distal pressure. The external pressure of an aneurysm or a neoplasm, or the blocking of the lumen by embolism or thrombosis, reduces or terminates the pressure, and this often without any alteration in the condition of the wall beyond the obstruction. A very interesting instance of this was under my care in the Royal Infirmary just about a couple of years ago. A man of middle age was admitted with aortic disease. The left arm furnished a beautiful example of Corrigan's pulsation, while there was nothing of the kind to be found in the right. When the pressure was tested in the two arms it was found that in the right arm the systolic pressure was 74 and the diastolic 55 mm. Hg; while in the left arm the systolic pressure was 130 and the diastolic 90 mm. Hg. The patient died somewhat suddenly, as the result of his cardiac disease, and after death a thrombotic obstruction was found at the origin of the right subclavian artery. The brachial arteries were carefully tested after death by Dr. Rainy and myself, and we discovered that the resistance in each artery was practically the same, the figures being 11 mm. Hg in the right brachial and 10 mm. Hg in the left.

*Methods of Investigation.*—Amongst the methods of estimating the arterial pressure from the *physiological point of view* the earliest observations were made by Hales, who ascertained the height to which the column of blood could rise in a glass tube, connected with one of the larger arteries in the horse. At a later date the use of the mercury manometer was introduced by Poisseuille, and the method was rendered more available by Ludwig. Still more recently the introduction of the elastic manometer, such as the membrane of Chauveau and Marey and the metal spring of Fick, may be particularly mentioned. It is not necessary on the present occasion to dwell on these physiological instruments.

Attempts at the *clinical estimation* of arterial pressure have a respectable antiquity, and it is possible from the writings of Aristotle, Herophilus, and Galen to bring forward much of importance as regards this aspect of the study of the pulse. In the works of Galen the investigation of the pulse is carried out with what, in this age, appears to be excessive refinement. There cannot be a doubt of the extreme importance of educating the sense of touch in the estimation of arterial pressure, and in my own clinical teaching, after impressing upon those who give me the privilege of teaching them that their first duty lies in trying to ascertain, with as much accuracy as possible, the state of the arterial walls, the next place is given to the resistance within the vessels. Although, to my way of thinking, it is quite as scientific to attempt the estimation of the temperature in a case of fever by means of the unaided thermic sense of the physician as to try to gauge the arterial pressure by means of tactile sensibility, yet it must be admitted that we are sometimes inclined to trust too much to our modern instruments. It is therefore necessary, before teaching the use of such instruments, to educate our clinical clerks most carefully in the methods of estimating arterial pressure by means of the sense of touch.

The first attempts at the *clinical estimation* of arterial pressure by *modern instruments* were made by Vierordt, who, using one of his own sphygmographs, attempted, by attaching different weights to it, to ascertain the amount of pressure necessary to overcome the arterial pressure. The first observer, however, who really brought the clinical estimation of arterial pressure within practical possibilities was von Basch, who was followed, at a somewhat later date, by Potain. Marey, Waldenburg, Hoorweg, Hürthle, Bloch, Mosso, and Oliver, during the last quarter of the



previous century, applied themselves to the problems arising from the study of arterial pressure in man, and also paved the way for future advances; but it is not too much to say that von Basch and Potain deserve the credit of being pioneers in our clinical methods. The present period is entirely due to the introduction by Riva Rocci of the method of circular compression of a limb, so as to obliterate one of the larger arteries and estimate the effects by examination of itself or of one of its branches further from the heart. It may be said at once, without fear of contradiction, that, with the exception of those sphygmomanometers which apply this method, there is none which need be seriously considered. The others are of historic, but not of scientific, interest. Another point is that the only reliable instruments are those which are provided with a column of mercury. All the others, whether employing an aneroid, a column of air, or a tube of spirit, are not to be trusted, unless they have been standardised immediately before use by comparison with a mercurial manometer. Judged by these standards, the instruments of Marey, Hürthle, and Mosso, which embrace the extremities, after the manner of the plethysmograph, and that of Gärtner, which estimates the pressure after the removal of the compression of a finger by the return of colour to the skin, as well as the instruments of Hill and Barnard, and of Oliver, cannot be recommended. On the other hand, the apparatus of Riva Rocci, Stanton, Cooke, Janeway, Martin, French, and Mummery are at once perfectly simple and absolutely reliable.

In the last two or three years *graphic records* of the arterial pressure have been obtained. The sphygmomanometer of Erlanger, while based upon the same principles as that of Riva Rocci, was the earliest attempt to furnish graphic records of arterial pressure in clinical investigation. A tube connected with the column of air, leading from the cuff to the mercury of the manometer, communicates with a hollow rubber ball, which responds, by distending and contracting, to every oscillation of the air and the mercury. This ball is surrounded by a glass bulb, leading by a tube to a tambour connected with a lever, which records the oscillations upon a smoked cylinder. These tracings furnish a complete record of the oscillations of the column of air, but do not furnish any record of the height of the column of mercury by which the pressure may be estimated. It is, accordingly, necessary to watch the level at which the mercury stands while noting the oscillations. The return of the arterial pulse at the wrist coincides with the com-

mencement of the large oscillations, and the point at which the large oscillations suddenly begin to diminish gives an indication of the diastolic pressure.

The sphygmomanometer recently introduced by me also takes advantage of the principle of circular compression in order to estimate the maximum or systolic arterial pressure, while it at the same time gives the minimum or diastolic pressure by the oscillations of the mercury. It has a mercurial manometer, the lumen of which is exactly that of the ordinary physiological kymograph. The air contained in the armlet can be increased, and the pressure on the limb therefore elevated, by means of a large syringe, and the pressure may be raised quickly or slowly according to requirements. By means of a valve the pressure may also be lowered quickly or slowly. A float rests upon the mercury, surrounded, as is usual in the physiological laboratory, by alcohol, and an upright rod of aluminium leads to a horizontal arm which writes on the revolving cylinder. In order to have the absolute zero, a fixed arm traces the abscissa upon the cylinder, which is driven by a clockwork placed horizontally, as in the instrument of Erlanger. The pulsations of the artery below the point of compression are recorded by means of a transmission sphygmograph. This consists of a tambour placed in contact with the brachial or radial artery, as may be most convenient, by a pelotte resting upon the vessel. This tambour is brought into communication by rubber tubing with another tambour, the movements of which are recorded on the cylinder simultaneously with the movements of the kymograph. The best tracing is obtained when the tambour in contact with the artery is larger than that connected with the recording lever, by means of which the movements are amplified. As usually employed, the pressure is raised with one steady, forcible expulsion of the air contained in the syringe until a high level is reached—150 or 160 mm. Hg being sufficient under ordinary circumstances. The valve already set at the slow escape allows the pressure to fall gradually. If sufficient pressure has been employed, the tracing from the artery, after a few oscillations due to the inertia of the mercury, shows an entire absence of all movements.

In the interpretation of the tracings there is one point which may always be depended upon with a reasonable degree of certainty; the point at which the pulsation returns in the vessel below the seat of compression is approximately the systolic pressure. This has been admitted ever since the observations of Vierordt and von Basch. The middle of the oscillation at this point is therefore

chosen as the index of systolic pressure. It is perfectly true that it is not the end pressure. The top of the first wave which appears gives the maximum systolic pressure indeed, but it is the lateral and not the end pressure which is recorded, and therefore the first pulsation by the method of circular compression, as was shown by Masing, does not give the absolute maximum. The determination of the minimum or diastolic pressure is not such an easy problem. Marey suggested that the point at which the largest swing of the instrument occurred was an index of the mean pressure, and this was adopted and amplified by Roy and Adami. It has been proved experimentally, however, by Howell and Brush that this does not indicate the mean, but really records the diastolic pressure. Masing, who obtained some tracings from the artery below the seat of compression, believes that the greatest movement of the sphygmographic tracing marks the diastolic pressure. This must, however, be an error, as the greatest amplitude of oscillation of the sphygmographic curve is very commonly found after the pressure in the armlet has been allowed to fall nearly, if not quite, to zero, and the results obtained by this method of estimation are unmistakably erroneous. My own method of obtaining the diastolic pressure is to ascertain where the greatest amplitude of oscillation occurs in the kymographic curve, and to take the middle point of this as the expression of the diastolic pressure.<sup>1</sup>

A very beautiful modification of my sphygmomanometer has been introduced by Singer, who has reduced the size of the apparatus, and has applied to it an ink pen, so that records can be obtained without the troublesome necessity of smoking the paper on the cylinder.

During this same period, when our attention has been applied to the graphic investigation of arterial pressure, *auscultatory determination* has also been studied. Korotkow, Ettinger, Bozowski, Krylow, Ehret, Fischer, and Gittings have, during the last five years, paid much attention to this subject, which is, both pathologically and clinically, of very great interest. These determinations are carried out with an ordinary sphygmomanometer of the Riva Rocci type, applied, in the usual manner, to the arm, and the brachial artery is carefully auscultated at a point about half an inch below the armlet. The arm is compressed in the ordinary

<sup>1</sup> The method of palpation of the brachial artery, advocated by Ehret, should have been mentioned. He finds that the brachial artery just below the cuff gives a peculiar hammering vibration at the time of the greatest oscillations, and this characteristic change is the criterion of diastolic pressure.

way, and when the column of mercury is allowed to fall, on releasing the valve, a distinct sound, with the character of a thud, is heard. This denotes the maximum, or systolic, pressure. Variations in this sound follow, and at last, with still further lowering of the column of mercury, the sound altogether disappears. This is generally understood to correspond to the minimum, or diastolic, pressure. This method has proved of much interest in my own wards, as we have found in it a very definite way of estimating the acuteness of sensibility of the observer. When the same observer listens to the sounds, and, at the same time, applies his fingers to the arterial pulse, the audible and palpable phenomena occur at exactly the same moment of time. If, on the other hand, one observer listens to the brachial artery whilst another feels the arterial pulse, a discrepancy is perfectly certain to take place. It seems to me, from my own observations in a large number of cases, in hospital as well as private practice, that the auscultatory determination cannot replace the previous tactile determination. It nevertheless furnishes a useful additional method to our modes of investigation.

*Possible Fallacies.*—It may very pertinently be asked, Are there no fallacies in our modern methods? It seems to me that our new methods of investigation provide few, if any, sources of error. With a good and simple instrument, the results which we obtain contain few possible sources of error in respect of determination, leaving at present out of account the question of interpretation. Riva Rocci and Henson have proved the accuracy of these methods on the dead body.

With all these instruments the influence of the personal equation is reduced to a minimum, and the question involves merely the variable acuteness of sensibility of the observer. This has been already referred to in my remarks on auscultatory determination. Russell, as has already been mentioned, believes that the wall of the artery under compression has a great influence on our results, and that degenerative conditions of the wall, in addition to increased contraction of its muscular tunic, account for some of our highest readings. It must be remembered, however, that the middle coat of a large, is relatively much thinner than that of a small, artery, and my own opinion is that Russell mistakes the increased pressure produced by contraction of the arterioles for changes in the walls of the large arteries which we are in the habit of investigating. Henson, from a long series of observations, showed that the resistance of the vessel walls under ordinary cir-



circumstances was, on an average, equal to 3 mm. Hg, and that, even when they were much sclerosed, it was never higher than 20 mm. Hg. The observations of Herringham and Womack showed that in only 2 out of 49 cases the resistance was above 24. We may therefore, until the contrary has been proved, assume that any changes in the vessels will not account, at most, for more than 20 or 30 mm. Hg.

It is clear that the limitations by which we are surrounded in attempting to estimate the absolute value of arterial pressure consist, to a great extent, in the difficulties by which we are beset in analysing the different factors maintaining the pressure. The relative amounts of cardiac energy and of vascular resistance are still, as was remarked by me in the Toronto discussion, a sealed book. A relatively low general pressure may be one which is nevertheless too high for the energy of the heart, while on the other hand a pressure which appears to be abnormally high may be one which is quite low in relation to the strength of the heart. The fact that spasm of the arterioles and smaller arteries has an important influence in modifying the pressure must always be borne in mind.

It must be added that when there is any very high degree of adiposity or any extreme amount of oedema, readings with the sphygmomanometer are rendered less easy and more doubtful. It is further to be noted that if there should be any liability to tremor, accurate observation is rendered less easy.

The pressure should always be estimated while the patient is in a position as nearly as possible horizontal, and, at the same time, resting comfortably. The limb which is employed for investigation ought to be absolutely at rest.

*Arterial Pressure in Health.*—The normal limits of arterial pressure require a brief notice. From numerous observations with our modern instruments by a large number of reliable observers it may be assumed with certainty that the normal systolic pressure in the young male adult does not exceed the limits of from 90 to 130 mm. Hg, while the diastolic is from 70 to 100. It is less in healthy women than in men of the same age, and still less in children. In healthy individuals variations in the arterial pressure take place without the presence of abnormal conditions, and must be accounted as normal. Daily fluctuations, probably dependent upon the condition of the whole system, are always found. The pressure usually reaches its highest level in the forenoon, after which it falls, frequently,

however, manifesting another but smaller rise in the afternoon. Recognising that such changes exist, we will be wise if we always take our readings in any individual at the same hour.

When the pressure is studied by means of continuous tracings smaller variations, both in the level of the pressure and the amplitude of the oscillations, may be observed. They are clearly analogous to the Traube-Hering curves seen in physiological tracings taken with the kymograph, and they undoubtedly depend upon changes in the influence of the vasomotor nerves.

The *external temperature* must exert some influence, but we still remain in want of sufficient observations upon the subject. So far, the general result of the investigations which have been made (by Müller, for instance) shows us that when an individual is exposed to any considerable alteration of the external temperature the arterial pressure is apt to rise.

The *atmospheric pressure* exerts considerable influence over arterial pressure. Most of our knowledge upon this subject is due to Crile, who has shown that the external atmospheric pressure and the internal arterial pressure stand to each other in a direct ratio.

*Posture* exerts a certain amount of influence. There is not much difference in arterial pressure between the recumbent and the sitting postures, but there is a much greater difference between sitting and standing. It is the diastolic pressure which undergoes the greatest changes, so that in this way the pulse pressure is diminished in the upright position.

The *influence of food* is not constant. After a meal the pressure sometimes rises and sometimes falls. Diminution of pressure is easily accounted for by the diversion of blood into the abdominal viscera, but this may be balanced by reflex stimulation of the vasomotor system. After the contents of the alimentary tract have begun to enter the circulation there is certainly a tendency to elevation of the blood-pressure.

The question of food at once brings up the analogous subject of the effect of certain articles much employed in daily life. It is almost certain that the usual influence of *alcohol* (after a slight initial rise produced by increased frequency of the heart) is to cause diminished pressure. *Tea, coffee, and cocoa* have not yet received the attention which they deserve, and a series of observations upon these substances would be most helpful. In regard to *tobacco*, we well know that its effects upon the vaso-constrictor apparatus bring about a very great increase of arterial

pressure, and this view entirely accords with a great series of observations made in France, showing that arterial sclerosis is frequently brought about by excessive vascular contraction, resulting from the abuse of tobacco.

*Muscular exercise* produces remarkable effects. Gentle exertion has little, if any, influence in raising arterial pressure, even when it is continued for a considerable length of time. Violent muscular exercise is followed first by a considerable rise of pressure, and this is succeeded by a striking fall at a later stage. The observations of Gordon, carried out when he was my house physician, are sufficient to prove these facts.

*Mental exertion* has similar effects, but these vary with the intensity of psychical processes. This is a matter which has been tested very frequently in my clinique, both on myself, my staff, and my clerks, with results which are extremely uniform.

The arterial pressure certainly falls during *sleep*; it is lowest in the early hours of normal sleep, rising gradually from that period until the hour of waking. Lewis Bruce, as well as Brush and Fayerweather, have brought before us most interesting observations upon this subject.

The *age of the individual* has considerable influence. Until middle life there is no great departure from the normal limits of arterial pressure, but after that period there is undoubtedly a much greater tendency to a higher level. Clifford Allbutt has devoted his attention to this subject, and to myself personally his teaching has been of the greatest benefit. Russell has criticised his opinions very freely, but to my way of thinking he has failed to shake the foundations upon which Clifford Allbutt's views are based. The real facts can only be ascertained from a very large series of observations. There are undoubtedly many individuals who retain comparatively low pressure during long lives, while in others a high pressure begins almost in youth. As a general rule, however, increase of age brings with it elevation of pressure.

*Arterial Pressure in Disease.*—In attempting to give a summary of the probable modifications of arterial pressure in pathological conditions, it seems to me that it will be advisable, in the first place, to deal with alterations which mainly *affect the circulation*. It is impossible to do this, however, without bringing into the field of discussion a large number of external agencies connected with every part of the body, seeing that the circulation is not merely subject to purely mechanical alterations, but also to chemical

changes, and perhaps even more subtle influences arising out of metabolic processes, while, at the same time, the heart and the blood-vessels show unceasing response to nervous influences, and the circulatory variations in turn react upon the entire organism. We must assume that the cardiac energy and the arterial pressure are reciprocal, while arteriole contraction and arterial pressure stand likewise in a direct ratio to each other. These general principles are necessarily subject to various modifications from changes occurring in any of the factors concerned in the physiological or pathological processes present in any given circumstances. There is a general correspondence, universally recognised, between the level of pressure and the cardiac conditions. When the arterial pressure is high the cardiac impulse is forcible, the second aortic sound is loud, and even the first sound produced by the left ventricle may gain in its intensity. When a case manifesting such conditions is watched for any length of time some increase in the size of the heart is made out by the ordinary clinical methods of palpation and percussion, as well as by the screen and the skiagram. In such cases, also, tracings obtained with the capillary electrometer, or with the string galvanometer, show us, as has often been observed by myself, that the electromotive changes are excessive; but, in addition to such results, there are some even more characteristic effects arising from the relations of the arterial pressure and the cardiac energy. No one could have been more sceptical than myself in regard to the possibility of aortic diastolic murmurs without valvular disease, it having always appeared to me that the origin of the aorta was so resistant as to preclude the possibility of stretching from stress leading to a strain. Some years ago, however, the stern logic of fact caused me to recognise that my views had been based upon insufficient experience, and in a paper in the *Edinburgh Medical Journal* some cases of diastolic aortic murmur without valvular lesions were published. In these cases the diastolic murmur appeared, disappeared, and reappeared, according to the condition of arterial pressure. These cases, however, were surpassed in interest by a recent experience in my ward. A man of middle age was sent in on account of aortic disease, and on admission it was found that a very musical diastolic murmur could be heard by anyone standing at the foot of the bed, *i.e.* about four feet from the heart. This murmur, as usual, was louder on standing than on sitting, and yet more so than on lying down, while after walking round the ward it became still further exaggerated. His arterial



pressure was found to be 95 diastolic and 145 systolic on admission. After a few days the murmur became so much diminished in intensity as to lose all of its musical character, and it could only be heard on auscultation with the stethoscope. After a few days more rest the murmur absolutely disappeared. It occurred to me that it might be of interest to find out the relation between the arterial pressure and the murmur. After quiet rest in bed the maximum arterial pressure was found to be 115, and with this pressure no murmur was audible; with gentle exertion the arterial pressure rose to 130, a soft, aortic, diastolic murmur developed. After some strenuous exertion, such as walking quickly three times round the ward, the maximum arterial pressure rose to 145, and the murmur became so loud and musical that the patient himself could hear it. It was obvious that in this case there was not merely stretching of the fibrous and elastic tissues forming the aorta, but also of the muscular fibres surrounding the aortic orifice.

Entirely analogous results have been obtained on investigating the pulmonary artery, and the pulmonary diastolic murmur of high pressure described by Steell, Duckworth, Barr, and myself is undoubtedly produced in the same way. Keith has shown us that a loss of tone in the muscle fibres surrounding the mouth of the vessel allows stretching of the fibrous tissue.

Low arterial pressure is, in general, associated with feeble cardiac impulses and short, high, weak sounds. The conditions in which this group of phenomena is found are frequently observed in surgical practice, and the work of Cushing and Crile demand our most careful attention.

Let me now direct your attention as briefly as possible to some conditions of arterial pressure in general and special affections. Amongst the *general diseases* let us take, as an example of the *infective* type, typhoid fever. Upon this subject the results of all observers are wonderfully uniform. In the overwhelming proportion of cases of typhoid fever the arterial pressure is reduced. The pressure begins to fall during the first week, and continues to fall during the second, third, and fourth week. During the fifth week it begins to rise, and gradually regains the normal. The most important statistics upon this subject are contained in the observations of Crile. From the modern arrangements in our Royal Infirmary few opportunities have been afforded me, during the last few years, of watching cases of typhoid fever, but the few observations made in my wards entirely accord with Crile's results.

Amongst *toxic* conditions let me cite the affections due to lead. In all the cases which have been under my observation during the last few years the pressure has been elevated, and the various symptoms stand in a direct ratio to the rise of arterial pressure. This is the case in regard to the digestive, muscular, and nervous symptoms.

Lastly, amongst such general diseases there can be little doubt that *metabolic* disturbances, in which the arterioles are subject to the baneful effects of imperfect tissue changes, are followed by high arterial pressure. A very large number of conditions, which we sum up under the heading of chronic gout, are associated with high pressure, and pave the way, by means of it, for the structural alterations in arterioles and arteries affecting the entire organism. Such conditions are of everyday experience.

Turning now to *special diseases*, let me, in the first place, refer to affections of the *vessels*. There cannot, in this age, be any doubt that, without any structural alteration in the circulatory organs, including heart and vessels, there are conditions in which periods of pressure changes, both low and high, occur through the influence of the vasomotor system. To such conditions Pal gives the name of *vascular crises*. They are attended by alterations in heart-beat and pulse-wave, and accompanied by modifications in the amount of every secretion, as well as in the appearance of the skin, and they give rise to very considerable disturbance of the nervous system, particularly in its subjective aspect. Such crises are frequently produced by causes of purely nervous character, but they are also produced by various poisons circulating in the blood. They are apt to lead, in time, to structural changes in the arterioles and arteries, particularly in the myocardium and in the kidney. Such conditions frequently manifest all the features of vicious circles, closely studied lately by Hurry, as the alterations in pressure are very apt to lead to nervous instability in varied forms. While crises of high arterial pressure are more common than those manifesting low pressure, the latter condition is also sometimes found as a critical phenomenon, and here again the tendency to a vicious circle is apt to manifest itself, as low pressure frequently brings about nervous depression. The arterioles and small arteries, therefore, may be regarded as subject to many influences leading to alterations in pressure, which bring in their wake undoubted pathological conditions.

When we approach the subject of *arterial sclerosis* we find a general consensus of opinion that endogenous poisons, no less

than those which are introduced from outside, produce definite arterial degeneration. One important point is concerned with the question whether high pressure leads to arterial sclerosis. There can be no doubt that the question must be answered in the affirmative, and amongst many workers upon this subject it is a duty to cite Clifford Allbutt, Savill, and Russell. The former of these observers has indeed classified out a series of causes under the categories of toxic, hyperpietic, and involutinal, but he frankly admits that there is no sharp dividing line between these classes. That this is far from being a solution of the whole problem must be obvious, when we consider the fact that there is frequently arterial sclerosis without high pressure. In 506 cases Groedel found 35 per cent. in which there was no elevation of pressure, while Rudolf, in collaboration with Ellis and Robertson, found that the pressure was only above normal in 50 per cent. of well-marked cases of arterial thickening. Such facts have been under my own observation for many years, and one of the most striking corroborations of this statement is to be found in the observations of Elliot Dickson upon the arteries and pressure in miners, where, with extremely common arterial changes, there is seldom any modification in arterial pressure.

The relation of *angina pectoris* to arterial pressure forms a somewhat complex subject. While there is a variety of angina pectoris of occasional occurrence which seems to be entirely due to spasm of the arterioles—the angina pectoris vasomotoria of Landois and Nothnagel—and while in a great many cases of organic angina pectoris the attacks are preceded and attended by rise of arterial pressure, due to spasm of the arterioles, there are numerous instances in which the arterial pressure is below normal. This is a fact to which attention has been more particularly called by Morison. It is, nevertheless, in such instances particularly that the pressure, although below normal, may be relatively too high for a weak and failing heart, and the caution already expressed should, in this place, be once more recalled. It is a well-known fact, to which Mackenzie has more particularly invited our attention, that in cases of arterial sclerosis there is a greater tendency to spasm of the arterioles than in ordinary conditions. Every observer who looks into the matter with an open mind must be struck by the enormous variation in the appearance of the arteries when a spasm of the arterioles is present, as compared with their condition in the absence of a spasm. A few years ago Pal showed that vessels which were almost straight with a

pressure of 95 became highly tortuous when the pressure rose to 200 mm. Hg.

Turning to the heart, we find in *acute pericarditis* an affection with a great tendency to bring about a lowering of arterial pressure, through its weakening effect upon the myocardium, and it is one of the affections in which a favourable or an unfavourable prognosis may be reached, according as there is little or considerable lowering of the pressure. All the recent cases of pericarditis which have crossed my path have made excellent recoveries, and on looking over their records, the striking feature is that in no case was the arterial pressure below 125 mm. Hg. When the pericardium is distended with fluid, as the result of an acute attack, the arterial pressure falls to a level which is alarming, and which is one of the surest indications of the necessity for active intervention. In the case of *acute endocarditis* there is likewise a liability to a fall of arterial pressure, and here, again, the prognostic significance of the arterial pressure cannot be overestimated. Amongst the various *valvular lesions* there is an immense series of different pressure results. In most of them, until fatal cardiac failure steps in, there is but little interference with arterial pressure, so wonderful are the powers of compensation possessed by the circulatory system. In aortic disease there is a most striking instance of remarkable divergence between the systolic and the diastolic pressure. This has been already referred to in the introductory remarks upon the co-efficient of pressure and the efficiency of the heart. It is very common in aortic disease to find a systolic pressure of 170 or 180, while the diastolic pressure may only be from 70 to 80. Even greater variations of pulse pressure have been recorded. Another interesting point in aortic disease, with insufficiency, is that the difference between the arterial pressure in the arms and legs is much greater than in health. To this point attention has been particularly directed by Hill and Hare. It has been suggested by the former that the condition is a reflex one, intended by Nature to prevent cerebral anaemia. Other valvular diseases produce comparatively little alteration upon the arterial pressure, except in so far as they bring about alterations in the efficiency of the myocardium. Diseases of the *myocardium* yield widely different readings; in fact, the results entirely depend upon whether the myocardial troubles are due to primary alterations in the heart muscle or are secondary to disease elsewhere. In such affections as myocarditis, following upon diphtheria or other



acute disease, the arterial pressure, in general, falls. The same occurrence takes place in the fatty degeneration attendant upon any grave disorder of the blood. On the other hand, in fatty infiltration the arterial pressure is frequently high, simply because in such conditions impure blood in the arterioles causes increased resistance. Needless to say, when the myocardium is undergoing hypertrophy, to compensate for increased resistance, the pressure is high. One of the most interesting of all myocardial conditions is to be found in heart block, in which, apparently from the long intervals between the ventricular systoles, there is in most instances a very high systolic, and a very low diastolic, pressure. Attention was called to this fact by myself about five years ago.

In affections of the *respiratory system* there are great variations of arterial pressure. For the most part, in asthmatic conditions there is a tendency to high pressure, while in pulmonary tuberculosis, as a general rule, the pressure is low. In pneumonia there are very different levels of pressure in individual cases. In the remarks on prognosis some useful indications will be brought forward in connection with this subject.

The arterial pressure in *glandular diseases* constitutes one of the most interesting subjects in modern medicine. In myxoedema, as is universally recognised, the pressure tends to be considerably above the normal; in exophthalmic goitre, although in general the pressure is below the normal, this fact is not of universal application. As the vasomotor control of the arterioles appears to be in a more unstable condition than in most diseases, it can be no wonder that the pressure is very variable. Addisonism furnishes one of the most fascinating problems in its relation to arterial pressure. In the fully-developed condition the arterial pressure is always low, because in it the medullary portion of the suprarenal body is destroyed, and the production of pressor substance is accordingly annulled. There may be a deep discoloration of the skin without alterations in arterial pressure, and in these cases we may assume that the cortical portion alone is diseased; on the other hand there may be profound depression, without discoloration, but with great reduction of the arterial pressure, and in such cases it is certain that the medullary portion of the gland is that which is affected. To these conditions attention has, within the last two years, been particularly directed by Rolleston and myself. Acromegaly sometimes gives high and sometimes low pressure. Here again the different effects may be correlated with the particular portions of the pituitary body which are implicated.

Amongst affections of the *kidney*, in acute nephritis, the pressure is in general elevated, but this is not so universal as is commonly supposed. In many such cases the pressure is really below normal. It has often seemed to me that the state of the pressure may vary according as the process affects the glomeruli or the tubules. This, however, is a subject upon which observations are greatly wanted. In most instances of chronic nephritis the arterial pressure is high, and it is particularly high in most cases of uræmic poisoning. The highest pressure which we meet with is found in chronic interstitial nephritis, with arterial degeneration and cardiac hypertrophy, especially (as was shown by Hasenfeld and Hirsch) when the splanchnic arterioles are implicated. In waxy degeneration of the kidney the arterial pressure is always low, unless the process is accompanied by a high degree of interstitial nephritis.

The relations which exist between alterations of arterial pressure and disturbances of the *nervous system* are of the most interesting description, seeing that a large number of nervous affections are produced by changes in arterial pressure, while, on the other hand, nervous disorders frequently bring about very definite modifications in the arterial pressure. In a considerable number of cases of adolescent insanity, and more particularly in precocious dementia, the arterial pressure is extremely low. The recent work of Rae Gibson has thrown a good deal of light upon the connection between the two conditions, and the facts which he has brought forward have been fully borne out by a few cases under my own care. In cases of melancholia there is, as a general rule, a pressure rather above the normal, while in mania, on the other hand, the pressure tends to be subnormal. In most of the painful affections, such as neuralgia and the crises of tabes dorsalis, the pressure is almost invariably above the normal during the attacks of pain. Pal believes that in such cases the cause of the pain is a vascular crisis. Possibly the most remarkable series of phenomena appearing on the borderland of circulatory and cerebral changes is to be found in the facts connected with cerebral hæmorrhage. It cannot for a moment be doubted that the essential factors in bringing about cerebral hæmorrhage are structural changes in the arteries and increased pressure within them. These points are, however, eclipsed in importance by the clinical observations that after a hæmorrhage has occurred the arterial pressure goes on steadily rising, and the result of the beautiful series of investigations by Harvey Cushing is to show that the

object of this high arterial pressure is to maintain the circulation in the vital centres at the base of the brain.

*Arterial Pressure in Prognosis.*—From the point of view of prognosis the study of the arterial pressure is of the greatest practical importance. In *acute disease* the relation between the rate of the pulse and the height of the pressure is of the highest value. In an address given by me some years ago the rule was enunciated that in cases of *pneumonia*, when the pulse-rate per minute does not exceed the height of the pressure in mm. Hg, the outlook is hopeful, but that when the converse occurs the prognosis is grave. Every observation which has been made since the date of that address has more firmly convinced me of its value. It has recently been emphasised in a most interesting lecture by Hobart Amory Hare. Within recent years pneumonia is the acute disease which has been most frequently under my observation, but it seems to me quite clear that some such formula might well be applied to other acute affections. In almost all of them, as has been stated, there is a tendency to a fall of the pulse-rate. In all of the acute diseases, if there is too great a tendency to fall of pressure, there must, in the mind of the observer, be considerable anxiety. Acute *nephritis* furnishes an interesting example of a disease in which the condition of pressure is of use from the point of view of prognosis. It has already been remarked that in many cases of this affection there is no increase, and that a decrease may even be present. If there is a considerable increase the prognosis is less favourable than when there is no rise at all.

Amongst *chronic diseases* most instances of anæmia result in diminished pressure, but this is by no means to be regarded as a general rule, as chlorosis has frequently increase of pressure. With the exception of such cases, it may be said that the lower the arterial pressure the worse the outlook for the patient. The same is true in *cachectic* conditions.

In chronic *nephritis* the arterial pressure is, in general, above the normal, but the degree varies according to the variety of the affection. In chronic *parenchymatous* nephritis, resulting in the *large white fatty kidney*, the arterial pressure is usually elevated, but by no means to the same degree as in interstitial nephritis. An interesting point, bearing upon the prospects of the patient, is that a rise of pressure above what has been found to be the normal for the case is very commonly the herald of uræmia. In chronic *parenchymatous* nephritis of the type ending in the *small white granular kidney* the pressure is considerably higher, but here,

again, a sudden rise is apt to portend the onset of uræmia. It is in chronic *interstitial* nephritis—the type which terminates in the *small red granular kidney*—that the arterial pressure reaches such enormously high readings, and it is in such cases that the prognosis is so largely dependent upon the influence of remedial measures upon the pressure. In severe cases, with cardiac, respiratory, and nervous symptoms, as well as extremely high arterial pressure, we are sometimes absolutely unable to influence the course of the disease to any appreciable extent.

*Treatment of Changes in Pressure.*—The last subject to which attention must be directed deals with the treatment of the conditions in which the arterial pressure is abnormal. In order to preserve the arterial pressure as nearly as possible at its normal level every method by which the general health can be best maintained must be adopted. Attention to the skin, both by baths and clothing; regulation of the diet, both as regards fluids and solids; care of every eliminating channel; and sufficient muscular exertion, together with adequate rest—all such matters must be taken into the most careful consideration. It must be obvious that there is no absolute rule to be employed in cases of departure from the normal; each instance must be judged and treated in accordance with its particular nature. When the arterial pressure is too low, as in acute diseases, it may be necessary to use digitalis, or strophanthus, or strychnine, or suprarenal substance, or its active principle, adrenalin. When, on the other hand, there is a great tendency to high pressure, the nitrites, the iodides, the hot pack, the vapour bath, and even venesection may require to be adopted, along with drugs which increase the action of every channel of elimination.

Such are the points connected with arterial pressure which seem to me to be those from which a most interesting discussion may arise, and upon which the Society will certainly wish the opinions of the members.

### DISCUSSION.

DR. WM. RUSSELL said in the ten minutes allotted to him he would attempt as clearly as possible to indicate what he regarded as the central phenomena in the important question before the Society. He was sure Dr. Gibson would understand that it was from no disrespect to him that he avoided much of what had been said. He would begin at the extreme end of the phenomena and mention a case which was at present in his ward in the Royal Infirmary. The patient came in



with a pressure of 295 mm. of mercury. With rest in bed and treatment it fell to 165, showing a fall of 130 mm. of mercury. This pressure swung back again to 180, and kept fairly steadily between 180-210, but while still in bed, this patient would develop a brachial pressure of 70 mm. greater than this, associated with symptoms which it was impossible to enter into here. This rise was invariably associated with a definitely palpable contraction of the brachial artery, diminution of its size, and hardening of its wall. There was no question as to what took place in the brachial artery. This was important, as the common statement, which all of them had been long familiar with, was that when pressure rose the periphery was constricted, but unfortunately the periphery had been regarded as capillaries and arterioles.

Nine years ago, before this Society, he had described a hypertonic contraction of the arteries. At that time he had not investigated farther back in the circulation than the radial artery. When, however, the modifications of the Riva Rocci instrument came into use, he found it was necessary to go farther back—from the radial to the brachial artery. He had found that the brachial artery was one which was often readily palpable, and the condition of its walls readily discovered. On post-mortem examination he found that the brachial artery might have a muscular coat which had undergone great hypertrophy, and that the wall had therefore become thickened. He had in his possession brachial arteries like pieces of caoutchouc, and yet the contention was that these thickened brachial arteries had nothing whatever to do with the compressibility of the artery. It was difficult to realise how it was possible to contend that this was so. After death an artery like that alters enormously; it becomes like a piece of thick cloth; it is no longer the elastic tube with its tonic and hypertonic wall. It seemed to him that that was the explanation of the fact that such eminent clinicians as Sir Clifford Allbutt and Sir Lauder Brunton talked about blood-pressure and heart-power while absolutely ignoring this condition of the vessel wall.

To-day he had read Janeway's latest contribution to this subject; it had just been published, and he went the length of maintaining that the calcified wall had no influence whatever on the compressibility of the artery. He would leave it to them to consider whether this was a reasonable position and one which clinicians could really accept.

Going on to explain another change that the thickened brachial artery undergoes, Dr. Russell referred again to the patient with a blood-pressure of 200. When the brachial underwent contraction the pressure was necessarily thrown back upon the aorta. Now there had been a difficulty here, and it was caused by the fact that there were certain cases with thick arteries which did not give a high reading. He had recently had a man in his ward with calcareous radial arteries and sclerosed brachials, in whom the brachial artery was not only

thickened but dilated and atonic; it had a thick wall, but it also was a big vessel (shown on blackboard), and whenever one got a large tube like that it was easier to constrict than a small tube like that (demonstrated). This man, a moulder by occupation, had a big heart, but he died from heart failure; his lungs had become œdematous, he was rapidly pouring out fluid into both pleuræ, and yet when dying he gave a pressure of 140 mm. of mercury. That is not a high pressure, but that man's heart was not working—if you take 120 as the average power of the heart—a quarter of the average. The forearm gave a reading of 30 mm. higher than the upper arm owing to the calcareous condition of the wall. At the post-mortem examination the muscle of the left ventricle was soft and fragmented, and that of the right largely replaced by fat, yet we were asked to believe that the arterial wall was negligible.

With their permission he would now go to the other extreme, away from the state of affairs in sclerosed vessels. This to him was the more interesting part of the subject, namely, the cases where there was a relatively low pressure. He would illustrate this by a patient who was convalescing slowly from an acute pericarditis with a distinctly feeble heart. In this patient, as long as the pressure kept to 120 or 125 mm., everything went on pleasantly and there was no discomfort, but if from constipation or unwise feeding or from mental disturbance the vessels become hypertonically contracted (it is a fact that they become hypertonically contracted, for the contraction can be seen and felt taking place in the brachial artery), the pressure rose to 140-145 when lying in bed. Constriction of the periphery has occurred, but that includes the brachial artery. When the brachial becomes constricted, it becomes thickened as the result of the hypertonic contraction, but the rise of pressure takes place behind this in the arch of the aorta. He could not, and no one could, say what the aortic pressure was. This rise in aortic pressure embarrassed the feeble heart.

The essential clinical fact was the constriction of the arteries up as high as the brachial, and it is that constriction which is being read; there were no means of estimating how much pressure that constriction had thrown back on the aorta, and it might be quite easily over-estimated, because, as Dr. Gibson pointed out, the heart very readily strikes a balance and recovers itself.

Another case of the same kind was that of an old gentleman, aged 80, suffering from angina minor. He had a pressure of 140-145 when an attack of angina minor was present; the attacks were associated with a palpable and definite tightening up of the radials and the brachials, and whenever the pressure was reduced to 120 there was no further heart trouble, and the radial and brachial arteries became soft. It was necessary to determine what would prevent the constriction, and in this particular case only very small quantities of iodide of potassium

were required to do so. The action of iodide Dr. Edwin Matthew would no doubt be able to say more about, but one plain fact was that in this old gentleman's case the pressure was 120 in the soft tonic vessel, and that when the brachial became hypertonic it went up to 140. The pressure was thrown back on the aorta, and the feeble heart was embarrassed. A rise in brachial reading in such a case meant a rise in aortic pressure. No one questioned that, but he would say this, that we were estimating not the pressure in the aorta but the compressibility of the brachial. The difference in the readings was the result of hypertonicity. The symptoms were those of heart embarrassment from constriction of a much wider periphery than had hitherto been recognised; the constriction threw the pressure back on the aorta, and therefore a greater strain was put on the left ventricle.

Dr. Rainy directed attention to certain physical aspects of the subject which were apt to be overlooked in purely clinical discussions.

He pointed out that in those methods of determining blood-pressure which depend on the use of an armlet, one had to assume that the tissues between the armlet and the vessels are so plastic that they may be practically considered to transmit the pressure in the same way as a sac of fluid would do. This assumption that the rigidity of the tissues is negligible is probably justified in ordinary cases, but, as Janeway and others have shown, there are certain conditions in which it is untrue. If, for instance, œdema is present, the method of armlet compression is quite unreliable. A not unreasonable suggestion for this is that the tissues, in consequence of the tension produced by the œdema, become more or less rigid, just as a pneumatic tyre gets rigid when fully inflated, and thus interfere with the transmission of the applied pressure.

The question of the allowance which may have to be made for resistance due to rigidity of the vessel wall appears at first sight to be a more difficult one, but, fortunately, blood-vessels remain alive for many hours after somatic death, and further, they can be maintained in life after they have been removed from the body. There is thus no difficulty in ascertaining the influence of this factor by experimental methods. Recent work by Stevenson has shown that transfusion of a vessel with a fluid which acts as a vasoconstrictor can induce a condition of hypertonicity, and by a simple piece of apparatus the difference between the external and internal pressures when the vessel is just flattened by the external pressure can be ascertained. The difference between these two obviously gives the exact amount of resistance to compression which such an artery offers. Stevenson's results show that there is a wide degree of variation within physiological limits. Roughly, in ordinary cases it will be found to be less than 10 per cent., and even where there is marked hypertonus it rarely exceeds 30 per cent., although in a few extreme instances it proved



much greater. One must therefore acknowledge that the vessel wall does affect the readings, but not to an extent which can materially vitiate the observations in the immense majority of cases.

He further pointed out that the blood-pressure in all the larger arteries is very nearly equal to that in the aorta, and that when one remembers that the resistance to the flow of ordinary fluids through tubes varies inversely as the fourth power of the diameter, it becomes obvious that practically the whole fall of pressure takes place in the arterioles and capillaries.

He also directed attention to the fact (which appears to be too much disregarded) that it is merely an assumption, and in many cases an unwarrantable assumption, to say that disappearance of the pulse coincides with closure of the vessel, for, as a matter of fact, the pulse disappears before the vessel is obliterated, as can be shown alike by experiment and by the application of mathematical formulæ.

In conclusion he referred to some of the earlier mathematical literature on the subject, and especially to two most valuable articles by Dr. Thomas Young, one of which was his graduation thesis, the other the Croonian Lectures which he delivered at a later period of his life, whilst in Germany the work of the brothers Weber, both on "Wave Motion" and on "The Application of the Study of Wave Motion to the Pulse," remains a standard authority to the present day.

Dr. Cargill Knott said it was difficult for the mere physicist to speak, but some remarks Dr. Rainy let fall require a little supplementing—he was not quite sure that he understood them. There is no doubt that the strain is very much greater in the large tubes. Then there was the question of the way in which the pulse falls off along these tubes. He always thought—he might be wrong—that the fading away of the pulse towards the periphery was due really to viscosity acting in the fine tubes. He had made an experiment, which Dr. Russell had expounded to him some years ago, namely, when the arteries in the arm are compressed the compression closes the pulse at the wrist. That seemed to show—though Dr. Rainy might be right—that a resistance had been produced there which was comparable with the resistance in the smaller arteries where the pulse is not at all conspicuous. It was a difficult question how that would affect the whole circulation; the whole circulation is affected by all those various forms of tubes, and the fact that by this constriction you destroy the pulse brings the arteries of the arm into somewhat the same category as regards the smaller arteries. In that case it might be that both points of view are sound enough, but he would be sorry to be dogmatic on the question. It is much too delicate a thing for a pure physicist to say much about; the physicist pretends to know nothing beyond pure physics. He might be speaking rashly, but that was what struck him



when hearing Dr. Rainy, and he thought it possible that both Dr. Rainy and Dr. Russell were right.

Dr. Elliot Dickson said he was not going to give any mathematical calculation, but as a country physician who had done some work with regard to this subject he should like to say something about arteriosclerosis in apparently healthy men. He and his brother, Dr. Arnott Dickson, had taken a series of 500 miners who were apparently healthy—who did not complain of any symptoms referable to their circulatory apparatus. They took the blood-pressure by the Riva Rocci instrument in these 500 men of all ages and found that in no less than 456 the arteries were thickened. Out of 116 men under 20 years of age 100 had easily palpated arteries. Of the 500 only 2 had atheroma, and they were old men. Only 44 out of 500 had radial arteries which could not be palpated. The blood-pressure was 140 mm. or over in 6 per cent. of the cases, and in each of these the urine was tested for albumen, with a negative result. In 469, or 94 per cent., the blood-pressure ranged within normal limits; all had thickened arteries; in some of the cases this was very obvious, especially in men with thin arms, where the arteries could be tested all the way up to the axilla. Over and over again the brachial was traced right up to the axilla; it could be picked up between the fingers and thumb and rolled about; it felt like a lead pencil. Tracings had been taken of brachial arteries, by Dr. Gibson's kindness, such as had been mentioned, showing readings of 120-118, and one of 95 mm. of systolic blood-pressure, so that whatever increased blood-pressure is due to, there can be no doubt that thickening of the brachial arteries is at least not the only factor. No doubt, with thickened arteries, there is a tendency to increased blood-pressure, but that was more evident when taken in connection with increase in age of the patient. In arteries of the same degree of thickening, so far as could be detected by the finger—and after considerable practice one could tell pretty well—there were great variations (from 85-165 mm., the former being obtained on three different occasions in a youth of 18). The great point about this series of cases is that the men were healthy and had nothing wrong with their circulation.

There were many cases of hypertonic contraction in men who came into the surgery to have teeth extracted, &c.; after such slight operations, as was to be expected, the reading was generally about 20 mm. higher than was found on testing the men on a second occasion.

So far as the cause of the thickening of the arteries in this series of cases goes, it is rather difficult to explain. All the cases have thickened arteries with low or normal blood-pressure. They correspond with what Clifford Allbutt calls toxic arteriosclerosis. The toxin in this series of cases has to do with conditions of work underground. He had known and tested cases where the arteries were perfectly

normal and where thickening developed within a year after working underground. The nature of the toxin is somewhat difficult to ascertain, but probably it has something to do with the ventilation underground. There is an enormously high percentage of carbonic acid gas in coal-mines; '7 per cent. represents good ventilation from a coal-miner's point of view; '04 above ground. Whether that was a factor in producing thickening of the arteries or not it was impossible to say meanwhile.

Dr. Oliphant Nicholson spoke of blood-pressure in regard to pregnancy.

Dr. Shennan said he rather hesitated to enter into a discussion which had been, so far, completely clinical, but one or two things mentioned had suggested several points to him. Firstly, as to the terminology. The previous speakers had used the terms *atheroma*, *arteriosclerosis*, *arterial sclerosis*, *calcification of the arteries*; probably the best term was *arterial sclerosis*, because it included all the others. It might be taken that high blood-pressure was the prevalent end of these conditions, the usual conditions found post-mortem being arteriosclerosis—general thickening of the arterial wall—often associated with atheroma, meaning, by the latter term, localised thickening of the wall, with constant degeneration of the thickened portion. One point in connection with calcification of arteries was that, in thickened arteries which were also calcareous, there was a constant feature, namely, that in the portions of the arteries corresponding to the flexures, *e.g.* the joints of the extremities, the calcareous deposit was not seen. That could be verified by X-ray photographs of the separated arterial tree. One could also tell where the flexures had been, such as the knee-joint, the elbow-joint, the groin, by the fact that the vessel was still quite pliable, the parts between the joints being resistant and calcareous. This should be taken into account in considering the resistance offered by the wall of the vessel to recording instruments.

With regard to the quantity of blood. He had recently been watching post-mortems in Munich. What had struck him as amongst the most common pathological changes found there were hypertrophy of the heart (Munich beer heart) and arteriosclerotic atrophy of the kidney. There was a general idea that it was the *quantity* of fluid (beer) which was the cause of the hypertrophy; if in place of the quantity the *toxic* effects of the beer were specially to be taken into account, it would be a terrible indictment of Munich beer.

With regard to the viscosity of the blood, he had noticed in one or two cases of polycythæmia that the heart had not been hypertrophied at all; in one case the coronary arteries had been extremely atheromatous, in fact a fine thread could scarcely be passed through the vessel. The hypertrophy was an interesting point, because Zétulle had stated that great hypertrophy might occur although the left

coronary was practically impervious. That there was some arterial communication between the coronary arteries was generally allowed.

Dr. Gibson had referred to interstitial nephritis and chronic parenchymatous nephritis; were they to assume that in all forms of chronic nephritis, and many people included with these the sub-acute forms, high blood-pressure was always present? Does chronic nephritis include the small red granular kidneys, and the white kidneys with coarse granulations? He himself recognised a small red kidney due to chronic nephritis, and another small red kidney due to primary arterial disease. In dealing with post-mortem examinations he was inclined to think that in renal disease, the result of arteriosclerosis, hypertrophy of the heart was distinctly greater on an average than in other forms of chronic kidney disease.

With regard to amyloid disease and chronic nephritis, amyloid disease, it had been said, was always associated with low blood-pressure, chronic nephritis with high blood-pressure; but the curious point was that one hardly ever met with pure amyloid disease of the kidney; it was always associated with chronic interstitial nephritis or chronic parenchymatous nephritis. It was a rather nice point to reconcile these statements.

Dr. Edwin Matthew referred to the action of certain drugs on blood-pressure (see p. 228).

Dr. Church remarked on the great usefulness of the blood-pressure recording instrument, and advocated that it should be found in every general practitioner's consulting-room. It was important in giving medicines where the blood-pressure was high not to give a remedy which would increase it, and where low a remedy that would lessen it. He had found to give something which would increase the blood-pressure where a patient was suffering from sleeplessness due to high pressure was harmful, whereas something which reduced the pressure generally induced sleep.

The time at which the blood-pressure was taken was also an important point; the pressure varied greatly in accordance with the time. For instance, the pressure after breakfast would be found to be 15 or 20 mm. more than that before breakfast; after a smoke, 20 or 30 mm. more than before the smoke.

With regard to iodide of potassium, it was no doubt very helpful, but its use might be greatly increased by the help of a hot bath. He had seen a hot bath bring down the blood-pressure 25 or 30 mm. It was wonderful what a hot bath could do in lowering pressure and adding to the comfort of the patient.

As regards children, it might be that the blood-pressure affected the physical power of the child and would be a guide of what the child was able for both physically and mentally. He had tested children

and found that the physical, and particularly the mental, capacity was in keeping with the amount of arterial pressure.

Dr. G. A. Gibson thanked the President for his graceful remarks, as well as those gentlemen who had taken part in the discussion and those who had assisted the debate by their presence. He hoped that the success of the discussion would be gratifying to the Council of the Society.

With regard to the remarks of the President, he did not think he had ever in his life asserted that the condition of the arterial wall was negligible, although he had not gone as far in the other direction as Dr. Russell. In the work of Herringham, to which he had referred, published in *The Transactions of the Royal Society of Medicine*, there were recorded resistances of 32 and 34 mm. Hg in the brachial walls, but what is such a figure in a pressure of over 300? That was his great difficulty.

Turning to Dr. Russell's contention, he "nailed his colours to the mast," since the high pressure is mostly due to the resistance produced by the contraction of the arterioles, possibly also of the capillaries, although that is open to doubt.

It was a pleasure to have listened to the observations of Dr. Rainy, who had explained a good many points very clearly indeed, especially in regard to the wall of the vessel; his statement, that the arteries removed from the body are still to be regarded at the time of the investigations as living, largely discounts the objections of Dr. Russell, that the condition of tonus has been lost.

Dr. Cargill Knott tried to smooth over the breach between Dr. Russell and Dr. Rainy, and seemed to think there might be a *via media* between the two views; as regards some of his statements, he thought Dr. Cargill Knott had argued from rather narrow premises to sweeping general conclusions. Such was the impression left on his mind, but he might have misunderstood the meaning of what was said.

Dr. Elliot Dickson's observations were well known to him, and he had been consulted by him some years ago on the subject. The view that the thickening of the arteries in his series of cases was entirely due to carbonic-acid gas was, he thought, the correct one; it was surprising how much carbonic-acid gas there was in the Fife mines.

He was interested in hearing Dr. Oliphant Nicholson's remarks in explanation of a subject in which he himself felt a great interest, but of which he had little practical knowledge; Dr. Nicholson's work on the effect of thyroid in post-partum conditions led him to expect this interesting communication from him.

With regard to Dr. Shennan's observations on arteriosclerosis and amyloid disease, he entirely agreed with Dr. Russell that arteriosclerosis is entirely different from atheroma, in fact the latter is more like endarteritis deformans in its general conformation. The President had



somewhat cleared up the point as regards the condition of the kidney. Under the term chronic interstitial nephritis there are several varieties, but most of these may be regarded as being part of a general disease—a widespread process. One observation he would like to make. The President would remember well that about the time when they were undergraduates they used to see a great many cases of waxy disease in this city; now they saw comparatively few. It used to be more common in Edinburgh than in the South. (The President here said that was not so, the lessening of the disease was due to antiseptics. Dr. Gibson had gone to Birmingham from Edinburgh and had found it less common; the President had gone to Newcastle and found it quite as common; it was purely antiseptic. He agreed with Dr. Gibson in the fact that waxy disease was less common now, but not with his explanation of the fact. Dr. Gibson rejoined that in the Seventies Birmingham could not show any waxy disease, and this could not at that date be due to antiseptic surgery.)

To Dr. Matthew's observations on therapeutics he had listened with the greatest interest. He could not help thinking, when Dr. Matthew was telling of his success with the iodides, with which most of them were in harmony, that in severe spasm he had found iodide of ethyl act at once, just as nitrites do. No doubt it was necessary to get free iodine into the blood.

With Dr. Church he agreed as regards the value of the sphygmomanometer in general practice, and hoped it would not be long before the instrument, in one or other of its simpler but reliable forms, was in the hands of every practitioner.

In conclusion he desired to express his grateful appreciation of the generous way in which his introductory remarks had been received by the Society.

IODIDES IN HIGH BLOOD-PRESSURE AND  
ARTERIOSCLEROSIS.

By EDWIN MATTHEW, M.D., F.R.C.P.,  
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It is universally recognised that the various nitrites and nitrates exert a reducing action in high blood-pressure. The result, however, is of short duration, and their application is consequently limited. Many other substances have been recommended as probable vasodilators, or in some other way as serviceable in hypertension. Among them are benzoates, hippurates, caffeine, theobromine given in the form of diuretin, leucin, thyroid extract, mercurial preparations, Trunczek's serum—a serum containing the salts of the blood in proper proportion—and iodides.

I have made numerous observations with these drugs in high blood-pressure, but with almost all I have obtained no beneficial results. Benzoates and hippurates I found of no benefit. Diuretin is a powerful diuretic, and indirectly may have an effect on blood-pressure, but it has recently been claimed to be an active vasodilator. I failed to find this in many cases that had previously responded actively to a nitrite. Mercurial preparations, particularly calomel, have been suggested as useful in hypertension. In some cases it may be useful because it removes from the alimentary canal substances that may produce arterial spasm, but I do not think it has a direct effect on blood-pressure. With thyroid extract I did not observe any beneficial effect. The iodides, on the other hand, give excellent results in suitable cases.

The inorganic iodides have had assigned to them a wide range of therapeutic usefulness. This wide application in disease presumably arose from a knowledge of their physiological action, which is one particularly on all mucous membranes. They possess also an alterative action, and so have been employed in apparently widely divergent conditions, *e.g.* tertiary syphilis, subacute and chronic rheumatism, sciatica, lumbago, chronic inflammations of all sorts, asthma, aneurism, arteriosclerosis, &c. In conditions associated with high blood-pressure and diseases or deformities of arteries their usefulness has been vaunted by some and decried by others. Zgorski, for example, declares that in cases with arteriosclerosis he has had no benefit from the iodine preparations, and many others agree with him. Other observers think them unsuitable in some cases and of great service in others. With this

latter opinion I agree. The varying opinions can, I think, be clinically reconciled by the newer lights recently thrown on the admittedly difficult subject of blood-pressure and arteriosclerosis, and the proper application of iodides will evolve with a clearer understanding of the varied phases of these conditions. For some time past I have been endeavouring to ascertain clinically the definite action of iodides in such conditions, and, in addition, to define the comparative merits of the inorganic and organic iodides.

*Mode of Action of Iodides in High Blood-Pressure—Iodides are Vasodilators.*—Many years ago Romberg gave it as his opinion that the action of iodine and the iodides was not on the blood-vessels but on the blood. Following on this Huchard described potassium iodide as a vasodilator and a depressor of arterial tension. Later Muller professed to have shown that potassium iodide had nothing to do with increased blood-pressure, and that it is useless where the disease producing the increased pressure has progressed to anatomical deformities in the blood-vessels, though it may be of service where the condition is still one of deficient blood irrigation. He held the opinion—and thus followed Romberg—that iodine preparations act by lowering the viscosity of the blood as a whole. Janeway has suggested that iodides have no direct effect on blood-pressure, but affect only the nutrition of the vessel wall, while Rolleston thinks that iodides act in arteriosclerosis by stimulating the secretion of the thyroid gland, and not by their depressant action on the circulation. My observations with iodides over a large series of cases with high pressure, and with high pressure and arteriosclerosis, have led me to conclude (1) that iodides exert a specific action in cases of high pressure before arteriosclerosis has set in or advanced, as I shall subsequently show; (2) that no effect is obtained by iodides in cases with high pressure and advanced arteriosclerosis.

From a study of their mode of action in these cases where they act specifically, iodides have a typical vasodilator effect on the peripheral arterioles. They act in a similar way to nitrites—not with their celerity of action, but they have a much more prolonged effect. A single dose of iodide, so far as one could judge, produces no vasodilator effect, but repeated 3 or 4 times a day, and continued, a vasodilator action is evidenced within 30 hours, and a complete action, *i.e.* a return to normal pressure, is obtained in about 3 days from the onset of administration. Such a result—as will be shown in concrete cases—can only, I think, be explained by a direct vasodilator effect on the peripheral arteriole circula-

tion over a large area, and, as is the case with nitrites, after a sclerotic condition has appeared in the arterioles the action of the iodides becomes limited in amount, and gradually lessens, until in advanced peripheral sclerosis no effect is obtained on the pressure with iodides. When arteriosclerosis has set in it is permanent and progressive, the arterioles become more and more involved in the process, they lose their dilating power, and nitrites and iodides are incapable of producing an effect.

*The Application of Iodides in High-Pressure and Arteriosclerosis.*—The proper application of iodides in these conditions depends entirely on a true conception of the clinical and pathological relationship of high blood-pressure and arteriosclerosis. No general statement as to the usefulness of iodides in these conditions will suffice. It is impossible here to enter into a detailed account or even summary of the various opinions as to the origin and development of high blood-pressure and its relation to arteriosclerosis, still, in order to obtain a correct view of iodide action it is necessary to state shortly what I believe, from a study of a large number of cases, to be the clinical relationship of these conditions.

Clinically I think we can recognise the following groups of cases:—

1. In the chronic forms of Bright's disease there is a constant and progressive high blood-pressure.
2. In many cases high blood-pressure exists (*a*) with no evidence, clinical or otherwise, of chronic nephritis; and (*b*) with no evidence of arteriosclerosis in the palpable arteries. The high pressure in all probability follows some toxæmia. This is an important group of cases which have to be looked for, called by Huchard the cases in the presclerotic stage of arteriosclerosis, by Clifford Allbutt hyperpietic cases, by others idiopathic hypertension, and by some presenile arteriosclerotic cases.
3. These idiopathic cases if untreated invariably develop arteriosclerosis, which is progressive. In this group one may include the large number of senile arteriosclerotic cases.
4. There is a group of cases where the arteriosclerosis has not resulted from high pressure but from other conditions, *e.g.* gout, alcoholic excess, lead poisoning, and following typhoid, pneumococcal and streptococcal infections.
5. There is a group of cases where anatomical deformities and thickening of the palpable arteries is present, and yet the blood-pressure is not raised.



These groups include all the cases with arteriosclerosis and high pressure, and the application of iodides varies in the different forms.

1. *Iodides in Chronic Nephritis*.—In all cases of chronic nephritis we have an increased and increasing pressure, which is, however, within limits beneficial to the patient and compensatory in nature. Any attempt to reduce the pressure to a healthy normal would be disastrous to the individual, but fortunately this

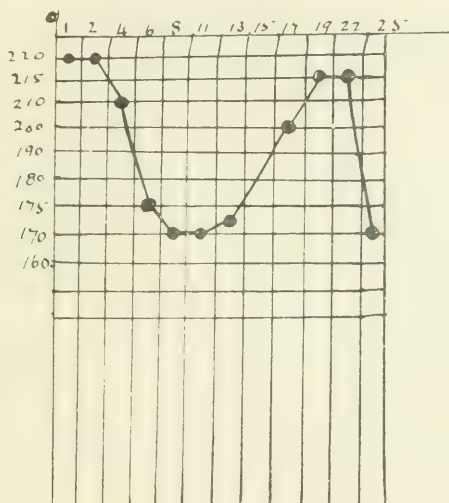


CHART 1.

is impossible. In the earlier stages of chronic nephritis iodides are very beneficial. They keep the pressure within limits, and so retard the progressive increase and relieve the strain on the left ventricle.

Especially in cirrhotic Bright's disease there is always a tendency not only to a slow progressive rise in the blood-pressure but also to additional sudden and temporary spasmodic rises associated with symptoms of headache, giddiness, often epistaxis, &c., and threatened overpowering of the left ventricle. It is in these additional temporary elevations that occur in almost every case of granular kidney that iodides are so useful. The iodide will promptly reduce the pressure, not of course to a healthy normal but to the normal for the individual with cirrhotic nephritis. One typical example will suffice:—

A woman, aged 53, suffering from cirrhotic Bright's disease,

had for a day or two been suffering from headaches and giddiness, and then had a sudden attack of bilateral epistaxis, not violent, but which went on for several days. Her pressure was 220 mm. Hg. She was given potassium iodide, grs. x. t.i.d. Within 24 hours her symptoms began to improve, and in 2 days the bleeding had stopped, in 5 days the headaches and giddiness had gone and the pressure stood at 170 mm. With the pressure at 170 mm.—a figure much too high for a woman of her age—she had no symptoms and said she felt quite well. The 170 mm. represented the pressure necessary in her case for the proper carrying on of the circulation, and the rise to 220 mm. was a typical example of the additional spasmodic rises so common in these cases. At the end of a fortnight, to test the efficacy of the iodide, it was stopped. In 2 days the headaches returned, and in 4 days the pressure rose again to 210 mm. Under the iodide it again fell and remained down. The symptoms in such cases are undoubtedly the result of the additional increase in pressure, and the vasodilator action of the iodide promptly reduces the pressure and the symptoms disappear.

2. *Iodides in so-called Idiopathic High Blood-Pressure.*—These cases undoubtedly exist, and probably would be more numerous if looked for. They do not come to us; we have to search for them in patients where symptomatically there is no indication that the blood-pressure is high. They are more commonly found in better-class patients than in hospital. The former come for advice for more trivial ailments, the latter reach us only after the initial stage of hypertension has passed and marked arteriosclerosis set in. Elevations of pressure may be present and continue, reaching 180, 190, or 200 mm., and very few symptoms be present at the outset, and such cases will always say that, apart from the ailment for which they seek advice, they have for some time felt exceptionally well. Now, such a condition is at this stage curable, and its recognition, therefore, is all important. If untreated, a progressive arteriosclerosis is the natural result—and it is particularly in this group of cases that we see the true and beneficial action of the iodides. These cases are curable by iodides. Clifford Allbutt strongly advises calomel as the standby in these cases, but I never found the same constant and certain action as from iodides.

Two examples with blood-pressure charts will illustrate the enormous benefit of iodides in this group:—

(a) A comparatively young man of 38 had complained of severe

headache for some time and sickness for 5 or 6 days, with, as he said, shaking and shivering at intervals. The circulatory system showed a well-marked accentuated second sound in aortic area—the heart was not enlarged. The blood-pressure measured, when first seen, 210 mm. Hg. There was albumen in the urine, but he had had a gleet for some time to account for its presence. (In these early cases of hypertension there is not usually albumen.) Other systems quite healthy.

For a fortnight he was kept in bed, dieted, and given calomel and salol. The pressure, as seen from the chart, remained during this time about 210, with occasional excursions to a higher figure. The headaches remained unabated. Potassium iodide was then

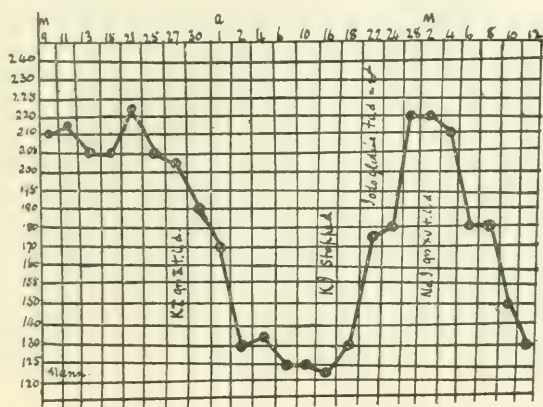


CHART 2.

started—grs. x. t.i.d. The next day the pressure began to fall, and in 6 days had fallen to 125 mm.—a normal pressure. The headache had disappeared, and he said he felt quite well. The iodide was given for 17 days. It was then stopped to observe if the effect was lasting, but more particularly to ascertain if the fall was actually due to the iodide. Within 2 days the pressure had again risen, and in 10 days had reached the original 220 mm. Sodium iodide, 15 grs. t.i.d. (=10 grs. KI), was started 3 days later, and this was followed by a prompt fall to 140 mm. Hg, at which level the pressure had remained when seen a fortnight later. The iodide was then stopped and the pressure was still 140 mm. when patient was again seen in about a fortnight.

(b) The second case was that of a man, aged 50, who for several months had suffered from severe pain in the head with throbbing

over the temples, and giddiness to such an extent that he had not worked for a fortnight. He had also some shortness of breath and cramps in the legs.

On examination the aortic second sound was accentuated. The heart was not enlarged. Some moist sounds present at the bases of the lungs. There was no albumen in the urine. Other systems normal. The pressure was 175 mm. Hg. For 5 days he was kept in bed, dieted, and bowels regulated. The shortness of breath disappeared, but he still had headache and giddiness. He was then put on potassium iodide, grs. x. t.i.d., and, as will be seen from the chart, the pressure fell to normal—110 mm. Hg—in about 6 days. The

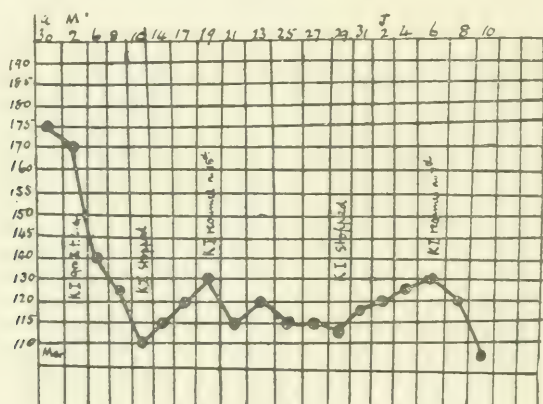


CHART 3.

giddiness had now gone, though some headache still remained. The iodide was then stopped for 7 days, and the pressure rose to 135 mm., but on resumption of the iodide it again fell to 110 mm., with complete disappearance of the headache. When last seen the patient was taking no iodide, and his pressure was 110 mm.

These two cases are only illustrative examples of the type of case where iodides show their true and full action in hypertension. In these cases there was no arteriosclerosis and the arterioles were still capable of full dilatation, and the pressure consequently fell to normal. In these cases the arterioles are in a state of spasmodic contraction, and the potassium iodide acts as a vasodilator, as a nitrite does, and not, I take it, on the blood—diminishing viscosity—or on the vessel wall—an alterative action.

3. *Iodides in High Blood-Pressure after Onset of Arteriosclerosis.*—If the cases I have just been describing be untreated,



in time arteriosclerosis sets in and gradually progresses. This sclerosis affects, to start with, the regulating mechanism of the blood-pressure, *i.e.* the arteriole system. In a state of spasm only these vessels can dilate and respond to a nitrite or iodide, but after sclerosis has set in the power of dilatation becomes lost, and we do not get the same well-marked effect as before. Still, a part of the controlling arteriole system is still active, and we get a partial response to the iodide.

The accompanying chart will indicate the action. It is of a patient whose symptoms I need not detail, but who had a pressure of about 220 mm. Iodide was partially effective, maintaining the

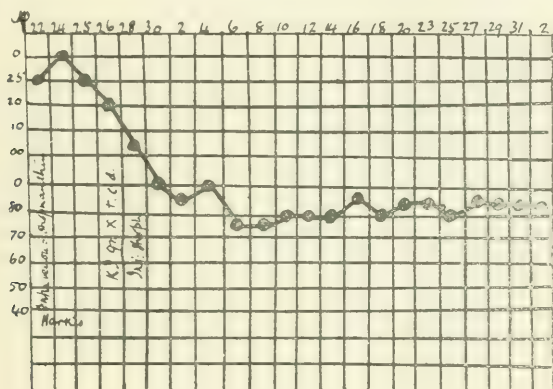


CHART 4.

pressure at between 160 and 180 mm., with very considerable benefit to the patient. These cases are met with probably more commonly than any others—cases where iodide exercises a partial reduction in pressure, but, because of the arteriosclerosis, not a reduction to the normal. We have now an incurable condition. Such patients are constantly returning with an exacerbation of symptoms.

4. *Iodides in Advanced Arteriosclerosis.*—The sclerotic condition in the arterioles, and now in the arteries also, progresses. The arterioles become less and less dilatable, and so respond not at all either to a nitrite or iodide. These cases, too, are quite common, and are usually to be found in elderly men—in women much less frequently. The pressure is usually very high, varying from 220 mm. to 260 mm., and iodide, even when pushed, has no effect on the pressure.

The accompanying chart of an advanced case of arterio-sclerosis will show the uselessness of iodide in these cases.

5. *Iodides in Cases with Anatomical Deformities of the Arteries (Atheroma) without accompanying High Pressure.*—This is an important group of cases to recognise. Marked atheroma of the peripheral arteries may be present, and the hæmomaneometric reading shows a normal or nearly normal pressure. In these cases a rise of pressure is not to be expected. Physiologically we know, and experimentally it has been proved, that a rise in blood-pressure is normally overcome by dilatation of the countless arterioles in the abdominal viscera, evoked by the depressor nerve, and that an abnormally high blood-pressure cannot exist permanently unless there be damage to the visceral peripheral circulation. In these

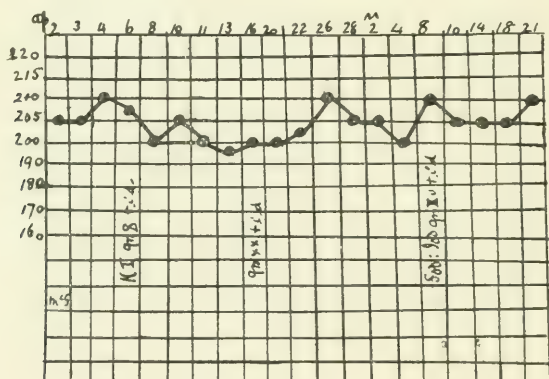


CHART 5.

cases of atheroma of the palpable arteries the arterioles have escaped. There is therefore no rise in pressure, and the use of iodides is uncalled for.

6. *Iodides in Aneurism.*—I would draw attention here to the use and action of iodides in aneurism. Iodides are invariably used in this condition, the beneficial effect being ascribed to some alterative action possessed by the drug. From my observations with iodides in this condition I believe that their action is not an alterative one, but, as in other cases of hypertension, a vasodilator one. The symptomatic improvement is always concurrent with a fall in the blood-pressure. All cases with aneurism have hypertension, some more and some less. The following example will illustrate my point:—

A woman, 52 years of age, has been under my charge in Leith

Hospital for many months, with intervals. She has a large aneurism of the transverse part of the aortic arch, with the usual physical signs. On every occasion of admission she had intense precordial pain, marked dyspnoea, and cyanosis. She was unable to lie down in bed, and got little sleep. Morphia hypodermically and  $\frac{1}{2}$  gr. erythrol gave her partial and temporary relief. On every occasion, however, within 36 hours of being put on potassium iodide a marked alleviation of her symptoms was apparent. The pain disappeared altogether. She could lie down, breathed quietly, and her cyanosis disappeared. On admission on each occasion her pressure stood about 140 mm. Hg. Coincident with the relief of the symptoms the pressure fell, under iodide, to about 110 mm. and maintaining the iodide the pressure remained at that figure,

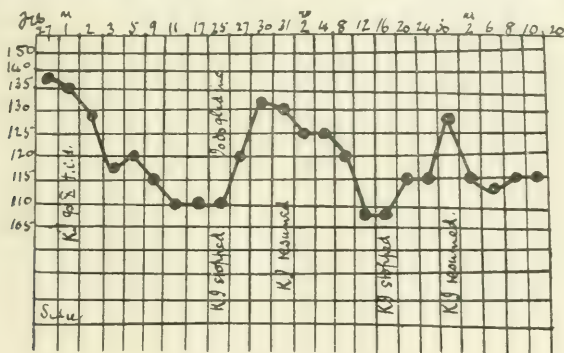


CHART 6.

with no return of symptoms. On several occasions the iodide was stopped. The pressure, as will be seen from the chart, very quickly rose and the symptoms reappeared, to disappear again with the fall of the pressure and the resumption of the iodide. I believe the benefits from iodide in aneurism result from its hypotensive action.

*Inorganic v. Organic Iodides.*—Within the past few years numerous organic compounds of iodine have been introduced. It is claimed for each and all of them that they are safer to use, and act more efficiently than the inorganic iodides. These we are asked to discard. The inorganic iodides it is said are faulty, the potassium or sodium element in the salt having an unnecessary and dangerous depressive action on the heart, and given as inorganic salts the iodides as a whole produce iodism or modifications of iodism. In addition, too, they are said to break up more

readily in the body than the organic, to produce their effects more quickly, to be eliminated more quickly, and therefore a much smaller quantity of iodine, as is found in the organic iodides, is necessary to produce the required effect. If justified, these claims for the organic iodides should undoubtedly relegate the inorganic compounds to an inferior therapeutic position.

The organic iodides now in the market are too numerous even to mention. They are being strenuously pushed, and more particularly in the conditions now under discussion—high blood-pressure and arteriosclerosis—is a claim being made not only for equal but improved results.

While investigating the action of the inorganic iodides I have employed a considerable number of the organic compounds, with the view of ascertaining whether these claims are justified clinically. Those most commonly used are:—

Tiodine—pill—a compound of thiosinamine and iodine.

Iodoglidine—tablet—a compound of a vegetable proteid and iodine.

Eustenine—powder—a compound of theobromine and iodine.

Iodopin—liquid—a compound of Sesame oil and iodine.

Sajodin—powder—the calcium salt of moniodo behenic acid.

In high blood-pressure the therapeutic effect of iodides, inorganic or organic, depends on the iodide content alone. For purposes of comparison, therefore, it was necessary to compare the recommended therapeutic dose of these organic iodides with a dose of potassium iodide containing an equal amount of iodine.

Of Tiodine, 2 pills contain 1·5 grs. iodine=2 grs. KI=3 grs. NaI.

„ Iodoglidine, 2 tablets contain 1·5 grs. iodine=2 grs. KI=3 grs. NaI.

„ Eustenine, 7 grs. to 15 grs. contain 1·5 and 3 grs. iodine=2 grs. and 4 grs. KI=3 and 6 grs. NaI.

„ Iodopin, 2 tablets contain 1·5 grs. iodine=2 grs. KI=3 grs. NaI.

„ Sajodin, 15 grs. to 45 grs. contain 3·75 grs. iodine and 11·25 grs.=5 and 15 grs. KI=7½ and 22½ grs. NaI.

The therapeutic doses of these organic iodides contain, as is seen, only a small amount of iodine, and are equivalent to a small dose of potassium or sodium iodide. From these small amounts of iodine it is claimed that in high blood-pressure and arteriosclerosis not only are beneficial results obtained but results equivalent to those got from much larger doses of KI. These claims are based on the more firm union of the iodine to the other substance forming the compound. The breaking up in the body is slower and the elimination is therefore slower.

I, therefore, in typical hypertension cases worked out the



elimination of these organic iodides and compared them with potassium and sodium iodides. I took the suggested therapeutic dose of each organic iodide and contrasted the elimination with potassium iodide. This was always done on the same patients, and the drugs were always given at the same time of the day.

The test used for the presence of iodine in the urine was chloroform and nitric acid.

The results of elimination can be compared from the following table:—

Drug.	Dose.	Amount of Iodine.	Appearance of Iodine in Urine.	Time Reaction lasted in Urine.	Remarks.
Potassium iodide	2 grains	1.5 grains	1 hour	30 hours	No reaction got in urine though repeated several times.
Sodium iodide	3 "	1.5 "	1 "	30 "	
Tiodine	2 pills	1.5 "	none		
Iodoglidine	2 tablets	1.5 "	1½ hours	24 "	Given first in capsules. No reaction.
Iodopin	2 "	1.5 "	1 hour	30 "	
Eustenine	7½ grains	1.5 "	1 "	36 "	
Sajodin	6 "	1.5 "	3 hours	50 "	

From these observations it will be seen that the time of appearance of the iodine in the urine differs but slightly in all the iodides, and the elimination lasts about the same time in the inorganic and organic iodides.

Only in the case of sajodin on every occasion the reaction in the urine lasted longer than in the case of the other iodides.

When the iodides—inorganic and organic—were given three times a day and continued, the results were the same. Potassium or sodium iodide given t.i.d. in the usual way appears in the urine for 3 days after the cessation of the drug. This period I found exceeded by none of the organic iodides, though again, in the case of sajodin, with a rather less amount than the corresponding dose of potassium iodide, the reaction in the urine was still got for the 3 days.

From these observations I cannot agree that the claims for the organic iodides have been established. And clinically, in actual cases of hypertension, in no case did I find them

of service in the recommended therapeutic doses. They failed entirely in the cases (whose charts appear earlier in the paper) where already I had found potassium or sodium iodide very beneficial. The pressure was never affected in the same marked manner.

The action of iodides in high blood-pressure depends on the iodine content, and for a beneficial result there must be a certain and sufficient amount of iodine present. It is constantly being recommended in text-books and publications that the administration of iodides in hypertension should be in small amounts and continued over a period. This I cannot agree to. What we desire with the iodides is an intensive action. It is the quantity of iodine absorbed into the blood that is of importance, and on account of the rapid elimination it is desirable in these cases to commence with a sufficient dose, to rapidly increase if necessary to 3 or 4 times as much for a few days, and then gradually reduce to the original dose. Ten grains 3 times a day I find the useful dose to begin with. This, if necessary, is increased to 25 to 30 grs. t.i.d. by 5 gr. increments each day, and then gradually reduced to 10 grs. By watching the fall on the pressure chart one can be guided as to the rate and amount of increase.

None of the organic iodides are recommended to be given in such doses, and with some it would be impossible. For example iodo-glidine is sold in tubes each containing 20 tablets, each tablet being equal to 1 gr. potassium iodide, and each tube costs three shillings. For a beneficial effect from such a compound one would require to administer the contents of 2 to 3 tubes each day, costing in most cases a prohibitive sum.

*Iodism.*—That potassium iodide and sodium iodide in certain cases produce inconvenient symptoms is admitted. The most common, as is well known, are coryza, rash, headache, depression, nausea, metallic taste in mouth, &c. Idiosyncrasy plays an important part in its production. No matter how large doses are given in some cases these symptoms do not appear, while in others even small quantities are not well borne.

Even with the organic iodides—containing as they do a small amount of iodine in the therapeutic dose—I have observed some of the symptoms of iodism, *e.g.* coryza, rash, headache, and metallic taste in the mouth. This is corroborated by almost all observers, and if it be claimed that they do not produce iodism so readily or in so great a degree as the inorganic bodies, they do so on account of their small iodine content, and, as I have shown, under such

conditions they are useless for treatment in high blood-pressure. The onset of iodism is, of course, inconvenient, and interferes with treatment, but one can undoubtedly assist in preventing its appearance. In administering large amounts of iodine one should be careful to neutralise the acid contents of the stomach by, say, the use of an alkaline mineral water, and by combining the iodide with bicarbonate of soda. Potassium and sodium iodides, on account of their very disagreeable taste, should always be given well diluted either with compound syrup of sarsaparilla or milk, and large quantities of these vehicles should be used. In certain cases, however, with weak digestion, inorganic iodides, no matter how given, produce nausea and a metallic taste in the mouth, and in these cases sajodin may be substituted, as it is tasteless and of all the organic iodides the least quickly broken up in the stomach. In all cases of arteriosclerosis and high blood-pressure, however, where iodides are indicated, I would strongly recommend that inorganic compounds should be employed, as in my experience the results are decidedly better, and will be at any rate until the organic substitutes are issued containing a sufficient amount of iodine in the therapeutic dose. It has been suggested that in high pressure cases sodium iodide should be employed rather than potassium iodide. Sodium iodide is said to have the more marked hypotensive action, while potassium iodide exerts a greater alterative effect. This I did not find in my observations. Both acted equally well in reducing pressure, remembering that 10 grs. potassium iodide is equal to 15 grs. sodium iodide.

#### CONCLUSIONS.

1. Iodides have a marked hypotensive action in high blood-pressure, without arteriosclerosis.
2. In advanced arteriosclerosis with high blood-pressure iodides have no hypotensive action.
3. Iodides act as vasodilators.
4. To produce a beneficial effect in hypertension, 10 grs. potassium iodide should be the initial dose. This should be rapidly increased if necessary.
5. Organic iodides—in the therapeutic doses recommended—contain too little iodine to be efficient.
6. Only in cases where iodides are contra-indicated by alimentary disorders should sajodin be substituted in corresponding doses.

## ON CONGENITAL HIGH SCAPULA.

A CONSIDERATION OF FOUR CASES, IN ONE OF WHICH WERE  
ABSENCE AND DEFECT OF RIBS AND A LUMBOSACRAL  
HYPERTRICHOSIS.

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CONGENITAL high scapula, sometimes erroneously referred to as congenital high shoulder, otherwise known as scapula alta congenita, Sprengel's deformity, is altogether a rare abnormality. The first term is the most correct, and preferable as it conveys to the mind with accuracy the condition it describes. The term "Sprengel's deformity" is objectionable, because meaningless to the uninitiated, and requiring an effort of memory for its recollection, and as shedding on Sprengel a lustre to which he is scarcely entitled, for though Sprengel described the condition from his own observation in 1891, it had previously, though briefly, been described by M'Burney in 1888, while some hold that Willett and Walsham's was the pioneer case in 1883.

The association of congenital high scapula with other deformities is a recognised fact, but the association with such an abnormality as is indicated by the title of this paper is uncommon. *A priori* one would not be surprised to find congenital displacement of the scapula have, in principal or subsidiary relation, some defect of the shoulder girdle or of the ribs, but such indeed is not the case, and in the majority the scapular is the only defect. To illustrate the condition of congenital high scapula I give the following four cases which have been under my observation for various periods:—

CASE I.—A female child, aged 9 months, presented a deformity which at the first glance appeared to be merely an increased deposition of fat passing from the nape of the neck towards the left. On closer examination this proved to be the spine of the scapula, its undue prominence being accounted for by the fact that the entire bone was placed higher on the left side than on the right. The left scapula was smaller and angled, so that the supraspinous fossa looked more directly upwards than normal, and was placed in the neck. There were no cervical ribs. A marked





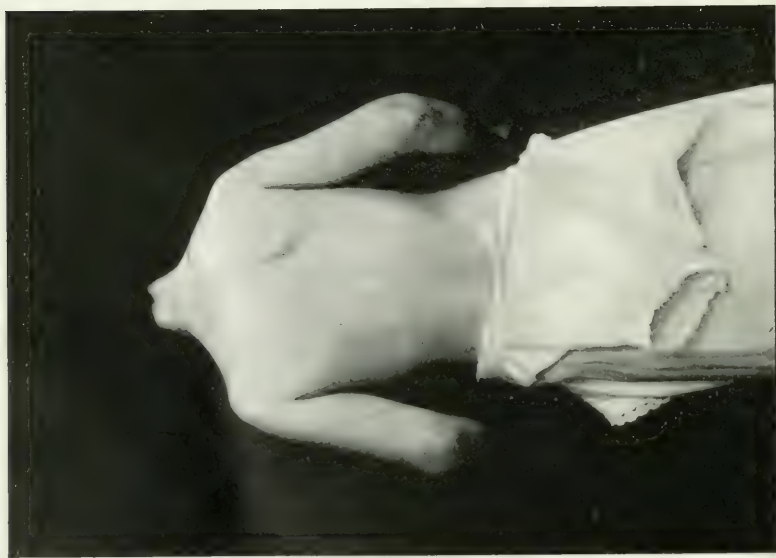


FIG. 1.—Congenital high right scapula. Female, aged 4 years (Case II).

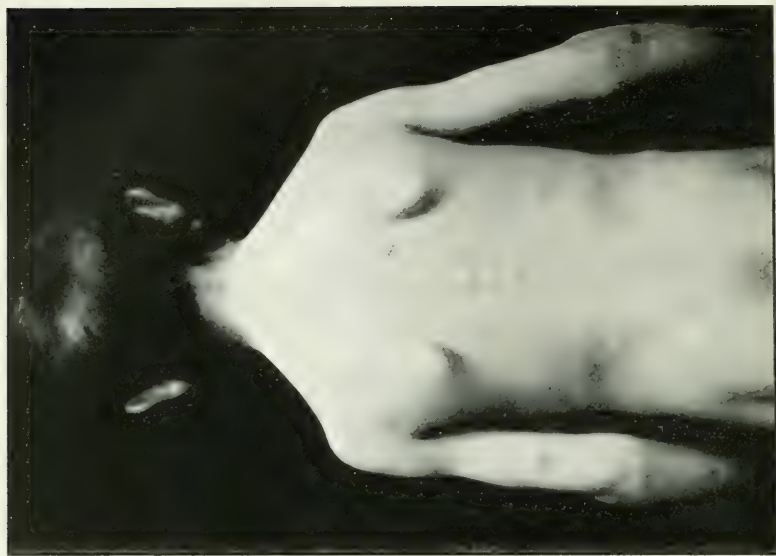


FIG. 2. Congenital high right scapula. Male, aged 7 years (Case III).

dimple\* was present in the skin at the vertebral border of the scapula, midway between the root of the spine and the inferior angle. The birth of this child had been in every respect natural.

CASE II.—In a girl of 4 years (Fig. 1) the deformity was accidentally noticed only two months previously while she was being bathed. The right scapula was smaller than the left, raised towards the neck, with a slightly oblique inclination, and the sub-scapular angle was increased. Movements were full and perfect, and the child had no other deformities. She was an only child of healthy parents. As no inconvenience is caused by the deformity, it is not to be wondered at that early recognition of its existence seldom occurs.

CASE III.—In a boy whose birth was a "cross-birth" no deformity was noted, and he was 2 years and 5 months old when the existence of congenital high scapula was pointed out by a nurse, whose presumably trained powers of observation enabled her to notice the inequality of the shoulders. In this child (Fig. 2) there was fulness in the right side of the neck, the right scapula was higher than the left by three-quarters of an inch, and slightly smaller. All movements were full in extent and free, and there was no other abnormality present.

In what literature of the subject I have examined—and the literature of this deformity is now fairly extensive—there is no evidence that any accident at birth or abnormal presentation has causal relation to congenital high scapula. With very young children, accuracy of measurement, thoroughness of examination, and leisurely comparison of the two shoulders is fraught with difficulty, and it is from the examination of older children or adults that one has to gather the anatomical characteristics.

The following case, shorn of its concomitant anomalies, illustrates well in detail the abnormalities of position and configuration which characterise congenital high scapula.

CASE IV.—A female, aged 12 years, a healthy and intelligent child, at present employed as a "shifter" in a jute mill, was referred to me on account of asymmetry of the shoulders. She was of good family history, her parents being well. She is the seventh of ten, of whom two are dead—one of measles and one still-born. The

\* Dimpling of the skin seems to be in frequent association with congenital deformity of bones. I have seen it in several cases in various parts of the body.

others are well and strong. Her birth was normal and her mother received no professional assistance. During infancy she had three attacks of "inflammation" of the lungs or bowels. She walked at sixteen months, and talked as early as the other children of the family.

When 3 years old she was knocked down by a cab but scarcely hurt. She was not laid up nor confined to bed, and the police surgeon stated that the injuries were trivial and that no bones were broken. It appears, however, that the critical parental examination at this time first disclosed the deformity, which was consequently ascribed to the accident.

On examination she was observed to have a slightly Mongolian cast of countenance, and to be undersized. There were evidences of approaching puberty. Stripped, she presented three developmental defects (Fig. 3):—(1) Congenital high left scapula; (2) defective upper left ribs; (3) hair-field over sacrum.

To take these in detail. 1. Congenitally high left scapula was obvious at a glance (Fig. 4), on account of the very striking asymmetry of the shoulders, the left being much the more elevated. Both scapulae were well defined, and the right normal in size, shape, and position. The inferior angle of the left scapula stood out more distinctly than the right, and when the arms were held straight forward the whole vertebral border was thrown into relief as in the so-called "dislocation of latissimus dorsi." Not only was the scapula raised in the neck, but it was tilted, so that the superior internal angle approached the clavicle and the inferior angle was thrown backwards, and this was again accentuated by the increase of the subscapular angle. The scapula was rotated on its sagittal axis so that its lower extremity came nearer the spine. The clavicles were equal and normal, but the entire left scapula was dwarfed. Its vertebral border measured 5 inches as compared with  $6\frac{1}{2}$  on the right, and the other dimensions appeared to be proportionally diminished. The inferior limit of the left scapula in rest lay at the angle of the fourth rib. Raising the extended arms above the head she did so equally as far as the level of the shoulders, but on continuation of the movement she had difficulty in quite raising the left, and tried to counteract the deficiency by voluntarily producing a marked lordosis. Nor could she bring the raised left upper extremity so near the mesial plane, nor draw it quite so far back. This defect in movement may perhaps be more clearly expressed thus: standing erect, without any exertion, she could raise the extended right arm till it touched





FIG. 3.—Congenital high left scapula. Female, aged 12 years (Case IV),  
General view and showing humeroscapular hypertrichosis.



FIG. 4. Case IV., showing relative positions of the scapulae and the obliquity  
and dwarfing of the abnormal one.



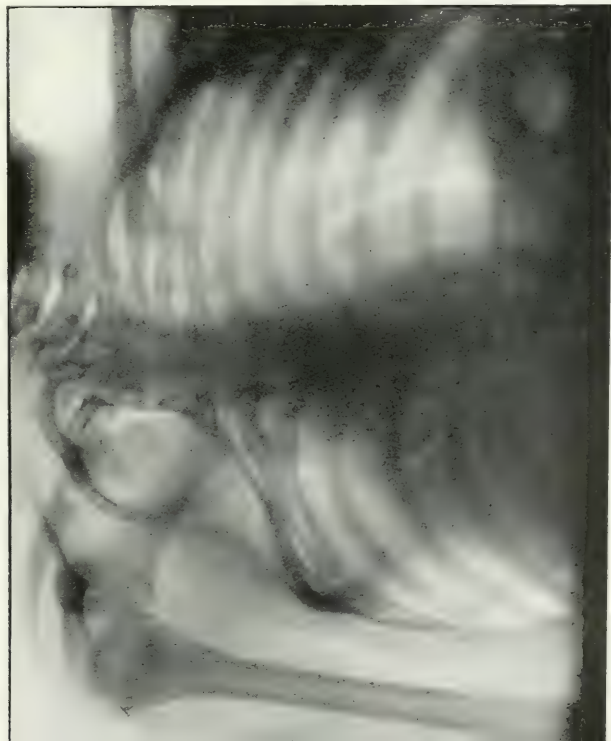


FIG. 5. Radiogram of Case IV showing defect in ribs. The relative position of the scapulae is observable.

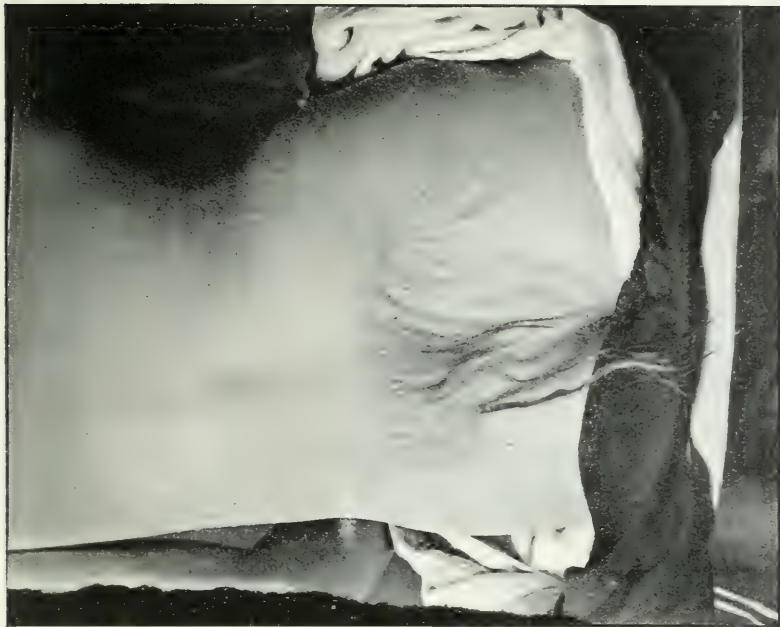


FIG. 6. Lambosacral hypertrichosis in Case IV, showing the extent and quality of the hair.





the pinna, but on the left side the arm could not be brought within a couple of inches of the pinna, nor backward beyond the level of the eye.

2. Defective development of the upper ribs was found on the left side of the chest during the examination of the scapula. The presence of this abnormality was evidenced by a marked hollow of the chest wall in the axilla, and the radiogram (Fig. 5) showed that this was due to complete absence of the third rib, that the fourth rib was represented by a mere shred of bone passing from the neighbourhood of the third dorsal intervertebral disc to fuse with the fifth rib in front of the angle, and that the fifth and sixth ribs were continuous at their angles. There was practically an absence of two ribs, represented by a retrocession of the thoracic wall of the axilla, but that part had due resistance, and there was no tendency to hernia of the lung. The defective ribs were probably adequately represented by fibrous tissue. Apparently in consequence of this costal deformity there is slight scoliosis with a little rotation.

3. There was also present in the patient a well-marked hair-field (Fig. 6), somewhat triangular in shape, with the apex pointed downwards, and situated at the posterior commencement of the cleft of the nates. It was 5 inches broad at its base, which lay over the last lumbar vertebra. The area was covered, but not thickly, with soft silky hairs, the longest of which measured quite 5 inches. There was no bony defect to be made out underlying this hair-field.

Six years have elapsed since the above notes, with the accompanying photographs, were taken, and the deformities remain *in statu quo*. The girl is bright, active, and healthy, and the abnormalities do not interfere with her work, but her diminutive stature seems to be more accentuated as her age increases.

There is abundant proof that the deformity does not interfere with ordinary avocations, though it relieves from military service on the Continent. Vorobyeff<sup>2</sup> publishes two cases from the Military Hospital of Kiew, where the subjects were exempted service though each was quite able for ordinary work, one being an agricultural labourer, the other's employment not specified.

The etiology of congenital high scapula is by no means obvious. Different theories have been advocated by different writers, but none has been generally accepted. "Hereditary tendencies" is not an explanation—indeed it is the case that such are rarely found. The family history in each of my cases, for example, was particu-

larly good—not even a suspicion of neurosis. Abnormal position of the arm during parturition might lead to injury, but not to the defect under consideration. To ascribe the condition to foetal rickets when there is no other evidence of rickets, and where, if there were, the same condition would apply to both scapulae, is but an incompetent suggestion.

Ballantyne<sup>14</sup> places the causal theories very succinctly. "Some authors,"<sup>15</sup> he writes, "have placed it in the same category with torticollis as a result of primary muscular defects; others<sup>9</sup> looked for an intra-natal cause, such as traumatism during labour; others<sup>16</sup> suspected a malformation of the scapula, a suspicion strengthened by one of Bar's specimens examined by Kirrmisson; and yet others<sup>17</sup> found it in deficient quantity of liquor amnii and dorsal displacement of the arm during foetal life." Ballantyne himself concludes that it is "sometimes, at least, of embryonic origin."

Kirrmisson<sup>18</sup> more recently admits that the causation is still doubtful. He acquiesces with Ballantyne apparently in admitting that it may be attributed to "a survival of the elevated position of the bone in the lower part of the neck during embryonal life; it is, in a word, an arrest of development."

There can never be a clear understanding as to the nature of the deformity until a distinction is made between high scapula and high shoulder. The scapula is not the shoulder, and only confusion can result if an abnormality of the bone be spoken of as an affection of a region. It is impossible to insist too strongly on this. In congenital high scapula obvious defects in the muscles are rare, but one must remember that the muscles, acting at a certain disadvantage on account of the scapula's position, may not be fully developed. High shoulder is a generic term, and would include high scapula. High shoulder may be congenital or acquired, and with it we have nothing to do; but in discussing the etiology of congenital high scapula there is no use in complicating the issue, as Bender<sup>1</sup> has done, by dragging in the consideration of acquired high shoulder. It is recognised that such a deformity may follow tuberculous or other inflammatory conditions, and that some arrest of development may result, or atrophy of bone may follow from want of use, while the position of ankylosis in "caries sicca" might tilt the scapula and produce a high shoulder.

Congenital high shoulder may be due to the presence of cervical ribs or be a mere symptom of congenital scoliosis, a condition primarily due to defective or excessive development of the dorsal vertebrae.<sup>19</sup> It is true that congenital high scapula is com-

monly associated with a slight scoliosis; that exists in about half of the published cases, but the scoliosis is incommensurate with the scapular displacement, and though it might exaggerate, could not cause it. Such scoliosis, whose convexity is almost invariably directed to the affected side, does not tend to increase as years go on. What appears to be a very marked "secondary kyphoscoliosis" is so radiographically figured by Müller<sup>33</sup> that one doubts if the case were uncomplicated elevation of the scapula, and he makes no reference to it in his text.

Kayser,<sup>3</sup> in recording a case which came under his observation, classified congenital high scapula into four groups:—

1. Where there is a bridge of bone between the vertebral border of the scapula and the spine;
2. Where there is complete absence of one or more muscles forming the shoulder girdle;
3. Where there is a long and everted supraspinous portion of the scapula;
4. Where there is no osseous bridge and the scapula is normal or smaller than usual, with short or otherwise defective muscles;

and states that "the great majority of recorded cases fall under the last group." It seems doubtful to me if these should be placed together, as in the first three classes the position of the scapula is secondary to some obvious primary defect, for congenital high scapula is a condition in which the scapular misplacement is the primary defect, and may be alone, but if in association, it cannot be accounted for by any of the other developmental defects which may be present. I would exclude cases of displaced scapula due to bony union between the vertebral border and the spine. Stiles<sup>34</sup> records such a case, and the case is by no means unique; but here the developing scapula is retained in the neck by the abnormal process of bone which attaches it to the vertebra and prevents its descent, and the scapular displacement is secondary and easily explained, and not to my idea to be classed with true primary congenital high scapula. Marked torticollis produces a slight elevation of the shoulder, but it is merely secondary to the more important lesion. In Vorobyeff's<sup>2</sup> second case the subject of the deformity had been in early life operated on by Billroth of Vienna for torticollis. The shoulder may have been lowered, but the high scapula remained the same.

Cases of absence of the trapezius muscle have been recorded, and it is noticeable that in these circumstances the shoulder

deformity is a depression of the scapula, not an elevation. In like manner a traumatism to the brachial plexus, causing induration in the neck at the site of injury and paralysis of the arm, produced a displacement of the scapula downwards and away from the spine.<sup>35</sup> Horwitz<sup>4</sup> points out that the scapula in its development is a cervical and not a dorsal appendage. He agrees with Sprengel<sup>17</sup> that excessive intra-uterine pressure, due to lack of amniotic fluid, is a primary factor in the causation. Could the observation be trusted, a case shown by Riolan<sup>5</sup> would be unique as regards its origin. The deformity was present in a boy, aged 11 years, in whom "during an attack of whooping-cough when a year old the deformity suddenly appeared and has remained without change since." Then follows a description of typical congenital high scapula. There was no paralysis in any of the muscles but a very slight degree of degeneration in the fibres of the trapezius. Riolan considered the deformity due to paralysis of the serratus magnus, permitting unrestricted contraction of the opposing group, viz. the rhomboids and levator scapulae, and that later a contraction of the trapezius took place. Professor Starr considered it due to primarily, hæmorrhage; secondarily, sclerosis at the fourth and fifth cervical segments of the spinal cord. Considering how unobservant parents are of congenital defects, one hesitates to accept the sudden onset but not the sudden discovery of the condition.

One cannot pass over without consideration the explanation that congenital high scapula is due to an affection of the trapezius muscle, where the lower fibres are deficient in development or innervation, and the upper fibres are more or less in spasm or contraction. Both Brown-Séquard and Hughlings Jackson<sup>6</sup> favour the theory of a paralysis of the lower fibres of the trapezius, but it must be granted that this is rarely obvious, and in the great majority of cases certainly non-existent. Pischinger<sup>10</sup> found nothing abnormal in the muscles in three cases examined by him, nor in their electrical reactions. There is a sufficient difference of opinion about the importance of the muscular affection to make one sceptical of its value. There was no muscular defect in any of my cases.

In nearly all the cases there is recorded some alteration in the size and shape of the high scapula. It is rare to have co-existing abnormality in any of the other bones of the shoulder girdle. Virden<sup>7</sup> notes that in a woman, 30 years of age, the clavicle on the affected side was "straighter and an inch shorter" than its



fellow, and a similar shortening, though less marked, was found in Travers Smith's case. M'Burney<sup>9</sup> on the other hand, in a woman of 23, noted that the clavicle on the affected side was "at least one and a half inches longer," and there was no paralysis of the scapular muscles.

The existence of congenital inequality in the corresponding bones of the two sides of the skeleton is too well known to require more than mention, and in the living subject these inequalities are mostly exemplified by measurements of the limbs. It is not common to find, however, that there is a measurable discrepancy in the size of the two scapulae. Yet such occasionally occurs. For instance, I recently saw a young lady, 19 years of age, who, complaining of some vague and indefinite pains, was afraid of developing a scoliosis such as an elder sister had. Her fears, however, were perfectly groundless, and the discomfort she complained of was apparently due to anaemia and some gastric disturbance. On examination the spine was found to be perfectly straight and of normal mobility. While the shoulders were of the same level, the inferior angle of the left scapula was an inch higher than that of the right, and this was accounted for by the vertebral border of the left being an inch smaller than that of the right. The superior internal angles of both scapulae were on the same level, and each bore normal relations to each other and the thorax. Curiously enough a similar inequality existed between the ossa innominata, the left being less developed than the right and the left trochanter major consequently less prominent. This observation accentuates that variation in level of the two scapular angles is not necessarily indicative of high scapula.

An ill-developed scapula is one in which there is a want of depth at the deepest part of each fossa, that is, at the root of the spinous fossae on the dorsum and of the subscapular angle in the venter. Along with this, none of the three muscles is so well developed or so thick as it should be, and consequently acts less effectively on the head of the humerus than fully developed muscles would.

According to Pischinger,<sup>10</sup> in every one of 17 cases collated by him the raising of the arm above the horizontal plane was restricted, but to a marked degree in only two cases, and in none was there any record of anomaly either of structure or electrical reactions of muscle. It seems readily comprehensible that muscles acting at a disadvantage, on a misplaced and possibly malformed bone, will not produce their normal effect in fulness of movement

of the parts on which they act. The imperfect movement upwards in the horizontal plane is therefore not to be wondered at, and there is no need to look for inherent muscular defects to explain it.

Multiplicity of congenital defects is common, and there is nothing to be gained by tabulating the numerous congenital defects co-existing with high scapula. The deformities may be in no way related to each other but merely demonstrative of the intra-uterine "*Belastungs difformität*."

Of the many and various abnormalities which accompany congenital high scapula, absence of ribs is certainly one of the rarest. There is, indeed, no causal relation between the two. Almost an exact counterpart of my fourth case has been published by Whipham,<sup>13</sup> where in association with congenital high left scapula is a slight sinistro-convex dorsal scoliosis, and the third rib takes a sloping course downwards while the fourth and fifth are rudimentary. As in my case, too, there were other less unusual abnormalities. The similarity between Whipham's illustrations and Figs. 4 and 5 of this paper are most striking. There is not in either case any structural defect of the vertebrae. In Willett and Walsham's<sup>20</sup> "*Congenital Malformation of the Spinal Column, Bony Thorax, and Left Scapular Arch*," the scapula was connected by bone to the sixth cervical vertebra, there was a cervical which fused with the first rib, and the fifth, sixth, eighth, and ninth dorsal vertebrae were absent with several ribs on both sides. Their observations made by dissection and on the macerated specimen are most interesting, and, of course, detailed to an extent that cannot be attained by examination of the living subject.

Absence of ribs associated with absence of vertebrae is mentioned also in a case reported by Porter.<sup>20</sup> Absence of several ribs is recorded by Gage<sup>21</sup> in a girl of 17, with consequent scoliosis but no elevation of the scapula. The sixth to the tenth ribs were wanting on the left side, and there was "a hernia of the stomach," especially on coughing. Perhaps this indicates some defective musculature of the abdominal wall, a condition which I have seen in an infant, and which allows of protrusion of the abdominal viscera on straining—a variety of gastroschisis less common than exomphalos. It is not unusual to find absence of ribs predisposing to hernia of the viscera, thoracic or other. In the discussion which followed Gage's paper, Willard of Philadelphia stated that he had observed a girl of 13 with absence of the anterior portion of the upper six left ribs outside their costal cartilages. Partial seems more common than complete absence.

and the defect is commoner anteriorly than posteriorly. Radiographic examination is most necessary, for it is impossible to differentiate by digital sensation the rib ends from the membrane. In Förster's *Missbildungen des Menschen*, quoted by Levy,<sup>22</sup> occurs the following passage:—"Finally, clefts in the thorax may be sometimes caused by defects of the ribs, in that several ribs of the one side may be wanting from the mid-point onwards, and the gap thus formed being closed by a firm membrane. It is the anterior portions of the ribs that are wanting, together with the rib cartilages. Sometimes the rib ends are not quite absent, but the ribs, the posterior portions of which are perfect, are continued forward as ribband-like bands." It is these "bands" which prevent hernia. In Levy's case the deficient development of the third and fourth ribs was associated with absence of the sternal portion of the pectoralis major. A similar case, but with complete absence of the pectoralis major, is recorded by Jefferiss.<sup>23</sup> The absence of muscle does not necessitate absence of ribs, and the converse is equally true. By far the greater number of muscular defects occur in the breast muscles.<sup>25</sup> John Thomson<sup>24</sup> points out that of 89 recorded cases of absence or defect of thoracic muscles, in 24 the cartilages, ribs, or both were implicated. The defect in his case, like that in Carter's,<sup>25</sup> is of the slightest as regards the ribs, the third rib stopping short of its cartilage and leaving a small space unsupported by bone. Young<sup>26</sup> reports a female, aged 21, with "weakness in the left side and scoliosis." There was complete absence of the ninth left rib, with a slight lateral curvature, but a large hernial protrusion between the eighth and tenth ribs, especially posteriorly. She had a dense imperforate hymen and entire absence of uterine organs and vagina. Hernia is more apt to be found in association with defect of the lower than the upper ribs. Murray's case<sup>27</sup> illustrates this. A male, aged 5 years, had absence of the eighth, ninth, and tenth left ribs, deficiency of eleventh, but overgrowth of the twelfth rib. Through the two-and-a-half-inch space in the thoracic wall the spleen could be distinctly felt, and was protruded into the aperture when the child coughed.

The interesting points brought out by a consideration of these and other cases are:—(1) There is no relationship between congenital high scapula and deficiency of ribs. (2) Deficiency of ribs in the upper part of the thorax is unassociated with hernial protrusion of viscera. (3) Deficiency of ribs in no way impairs vitality or ability.

The hypertrichosis, which is the third anomaly presented by the case specially under review, is a comparatively common con-

dition, and though found in any part of the body is frequent over the sacral or lumbosacral regions. It is not always so pronounced as in my case. Such hair-fields are characterised by the presence, over localised areas, of a profusion of hair. The hair is generally softer and silkier than natural, and is often deficient in pigment, as compared with the subject's natural hair. Lumbosacral hypertrichosis is of interest teratologically, because it is associated not infrequently with a spina bifida showing as a tumour, or with a spina bifida occulta evidenced by defect in the subjacent bones but without protrusion of the membranes of the cord. It is commonly associated, as in my case, with other developmental defects. As such, it may be looked upon as a stigma of degeneracy. It is curious to find it present in a case of a female cretin with myxoedema (Fusari, quoted by Portugaloff<sup>30</sup>), a disease in which sparseness of hair is the rule. Any congenital tumour may be associated, especially at its base, with a condition of hypertrichosis. It is usual that a spina bifida tumour itself is hairless, and this doubtless explains the bald spot in the centre of a lumbar hypertrichosis associated with spina bifida occulta recorded by Voelcker,<sup>32</sup> while in Portugaloff's case<sup>30</sup> the actual hair-field was surrounded by skin which was abnormally smooth and quite free from hair. These hair-fields are to be distinguished from hairy moles, in which there is much more pigmentation, and in relation to which various neoplasms, such as melanotic sarcoma, are liable to take origin. In relation to co-existing congenital defects one would exclude such as depend entirely on the involvement of the spinal cord. It is the case that serious spinal lesion may exist in a spina bifida occulta where there is no tumour and where the vertebral defect can only be made out by palpation (Hagenbach-Buchardt<sup>31</sup>), and it is interesting to note that operation and the division of intra-spinal bands or removal of exostosis has been followed by encouraging improvement.

It is usual for a practical surgeon to bring any communication to a close by a reference to treatment. In pure congenital high scapula there is no treatment to be adopted, for no treatment can be efficacious. The deformity interferes little with appearance, and practically not at all with usefulness and ability, and indeed the question of treatment would never obtrude itself were it not that the condition is so frequently confused with deformities brought about by inflammation or disease, and with other congenital anomalies which, as I have endeavoured to point out in my paper, ought to be and must be distinguished from true congenital high scapula.



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**CLINICAL RECORDS.**

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**FURTHER NOTE ON THE TREATMENT OF RESIDUAL URINE IN CONNECTION WITH ENLARGED PROSTATE.**

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RATHER more than ten years ago I had the honour of reading a paper before the Edinburgh Medico-Chirurgical Society on "Residual Urine in Cases of Enlarged Prostate." In that paper I ventured to suggest that the presence of residual urine being the result of non-emptying of the bladder, a probable cause of this was insufficient effort on the part of the patient.

The old man with a difficulty in passing water is apt to be contented with relieving the feeling of distension without fully emptying his bladder. The treatment that I recommended was that the patient should always make a second effort a short time after relieving his feeling of distension and discomfort, and do his best to get rid of as much more urine as he can.

After my paper was published (*Edin. Med. and Surg. Journ.*, August 1900) I received several communications from medical friends thanking me for my suggestions, and saying that they had been of use to their patients and also, in the case of some of them, to themselves, saving them from the fear and dread of catheter life and prostatectomy.

My reason for writing the present paper is to draw the attention of my professional brethren again to what has proved useful to some and may be beneficial to more. I will therefore repeat shortly the method that I originally suggested.

Suppose that a man, advanced in life, has symptoms pointing to the presence of residual urine, such as having to rise two or three times during the night to pass water. My recommendation is that he should at once commence to make the effort, to which I have already referred, to empty his bladder more thoroughly. It is not necessary or advisable to wait very long before making the second effort. On the one hand a small but appreciable quantity of urine will soon collect in the bladder of anyone after micturition, from the action of the kidneys. On the other hand, if one wait too long the bladder will have quieted down and will perhaps not respond very readily to the second call on it to empty itself. About two minutes is, I think, long enough to wait. If on making the second effort the patient is able to get rid of an ounce or two, the existence of a certain amount of residual urine may be diagnosed with certainty.

At first the patient should make the second effort after every act of micturition, except, of course, during the night. After a while it may be sufficient to insist on the thorough emptying twice daily, the best times being before going to bed and on getting up in the morning. In some cases it may be advisable for the patient to make a third effort before going to bed.

It should be borne in mind that the object of this procedure is to train the bladder to empty itself.

If the treatment succeeds, the amount of urine passed at the second effort will diminish till it reaches the minimum, which may be about a teaspoonful. In some of the cases reported to me there was apparently complete removal of the residual urine, in others only a diminution, in others, again, only arrest of increase. In all greater comfort was obtained, and the unpleasant necessity of having to rise during the night got rid of or diminished.

In the *British Medical Journal* for 19th March 1910, Professor Wesley Mills of Montreal published his experiences of residual urine, catheter life, and prostatectomy. His example has suggested to me that a similar personal experience illustrating the effects of my own method might be instructive. My attention having been directed to the subject of residual urine by the writing of the paper ten years ago, I realised that commencing symptoms required consideration. It was necessary to rise two or three times during the night, and it was found that by making the second effort it was possible to get rid of an extra ounce or more of urine. By careful practice this quantity was reduced to about a teaspoonful. Now it is even less sometimes. Moreover it is now possible to sleep for seven or eight hours without a break, though it is sometimes necessary to get up once during the night.

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#### CASE OF A FOREIGN BODY INTRODUCED INTO THE RECTUM, REACHING THE DESCENDING COLON. REMOVAL PER RECTUM.

By G. DUNCAN WHYTE, M.B.,  
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ALTHOUGH there is little of interest from the point of view of diagnosis or treatment in the following case, it presents certain features that are unusual. The patient, a Chinaman, æt. 45, returned from fishing at an early hour one morning and fell asleep in a small temple near the shore. He awoke to find himself being held down by three men, while a fourth was engaged in introducing a piece of bamboo into his rectum. When this operation was completed and he was released, he pursued his assailants with a knife for some distance, and thereafter

he found that the foreign body had entered so far that he could not withdraw it.

After visiting the homes of his assailants and intimating that he was about to die, and that they would be held responsible, he set off on a four-mile walk to the hospital of the English Presbyterian Mission at Swabue, where he took his place among the other out-patients and subsequently entered the consulting-room in the routine way.

*On admission* the patient had a somewhat anxious expression, and complained of discomfort in the left side of his abdomen. The respiratory movements of the left half of the abdomen were seen to be diminished, the left rectus not being relaxed, and a thorough examination was impossible owing to the muscular contraction and rigidity. Nothing was discovered in the left iliac region, but in the left lumbar region there was marked resistance which extended beneath the ribs. Chloroform was administered, and it was found that while the lower part of the foreign body could be easily made out in the iliac region, the upper part was protected by the ribs and could not be defined.

By introducing the hand into the rectum the lowest part of the bamboo could be felt, and this was then secured in the bite of a pair of bullet forceps guided along the hand. By repeatedly passing the finger over the "presenting" part, one was able to prevent the sigmoid from being pulled down in front of the body as it was slowly extracted. The piece of bamboo was found to measure 8 inches in length and  $1\frac{1}{2}$  inches in diameter.

The patient made an uninterrupted recovery.

*Comment.*—The introduction of conical pieces of bamboo into the rectum is not infrequently practised in this region, and that for the following reasons:—(1) Sodomy is extremely prevalent, and is a capital offence. (2) Owing to the expense and the delays of legal processes, and the fatal consequences to the accused if he is convicted, the relatives of the injured lad usually take the law into their own hands. (3) The Chinese have a perfect genius for "making the punishment fit the crime," and the shape of the piece of bamboo is certainly suggestive.

The piece of bamboo is not usually *completely* inserted into the rectum; part remains projecting from the anus, so that the victim can remove it when he is released. In this case the bamboo was only 8 inches long, and this, along with the rounded shape of the tip, would permit of the body working its way through a fairly short sigmoid and into the descending colon during the patient's violent exertions in pursuit of his assailants.

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## CASE OF IMPLANTATION OF THE OMENTUM IN THE ABDOMINAL WALL FOR HEPATIC CIRRHOSIS WITH ASCITES.

By D. P. D. WILKIE, M.Ch., F.R.C.S.,

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THE patient, a seaman æt. 36, had for two and a half years suffered from symptoms indicating cirrhosis of the liver. At the outset he was troubled with loss of appetite for food, vomiting, pain in the right hypochondriac region, and constipation. After these symptoms had persisted for five months he began to suffer from swelling of the feet and legs, then from swelling of the scrotum, and finally from swelling of the abdomen. In July 1908 he was admitted to a medical ward in Leith Hospital suffering from a marked degree of ascites. His abdomen was tapped and he was kept in bed for five weeks. On his discharge from hospital the abdominal swelling had entirely disappeared, and he was able, a few weeks later, to return to work. He remained in tolerably good health for one year; then his feet, legs, and abdomen began to swell again, and he was admitted to hospital in Stettin, where his abdomen was again tapped and where he remained in bed for four weeks. Within one month of leaving hospital the abdomen again began to swell and he was unable to return to work. He now began to suffer from shortness of breath, and after some months' treatment at home, with no improvement, he was re-admitted to the medical side of Leith Hospital in July 1910.

*Previous Illnesses.*—Gonorrhœa twice. Syphilis ten years ago.

*Habits.*—Patient has been a very heavy drinker of both spirits and beer for fifteen or sixteen years. Not infrequently he would take as much as 2 pints of whisky and 12 pints of beer in a day, and during occasional bouts would be under the influence of alcohol for one to two weeks on end.

For many years he smoked 8 ozs. of tobacco per week; since his illness started he has reduced this to 4 ozs.

*State on Admission to Leith Hospital in July 1910.*—Patient is a broken-down looking man, and looks over 50 years of age. There is marked cyanosis of the lips and ears, dilated venules on the cheeks, and his red nose and bloodshot eyes bespeak the confirmed alcoholic. He is very breathless and cannot lie flat in bed, his pulse is very irregular, and the vessel wall is thickened.

The heart is considerably dilated, and moist sounds are heard over the bases of both lungs. There is marked general tumidity of the abdomen, dulness on percussion in both flanks and in the suprapubic region, and the lower border of the liver can be palpated 2 ins. below the right costal margin.

The urine contains a trace of albumin and has a specific gravity of 1008.

*Treatment.*—For three weeks the patient remained in the medical side. His abdomen was tapped on two occasions, but the fluid re-accumulated, and, in spite of rest in bed, the breathlessness and cyanosis persisted. The advisability of surgical treatment was then discussed, and, in spite of the grave risk of a post-operative pulmonary complication, operation was decided on.

*Operation 5th August 1910.*—Chloroform anaesthesia. An incision 5 ins. long was made in the mid-line above the umbilicus. On opening the peritoneal cavity about  $3\frac{1}{2}$  pints of straw-coloured fluid escaped. The liver presented the appearance of a very pronounced coarse, or hob-nailed cirrhosis. The other abdominal viscera showed marked venous engorgement. The veins of the omentum in particular were much enlarged and tortuous, many of them being the size of slate pencils. It was decided to implant the omentum in the sheath of the right rectus muscle in direct contact with the superior epigastric vessels. Accordingly the rectus muscle was separated from the posterior layer of its sheath for a distance of 3 ins. A small incision was made at the outer border of the sheath, a forceps was thrust through this and the omentum, after its surface had been abraded by rubbing with dry gauze, was pulled into the rectus sheath, and fixed at its outer border by a catgut suture. The herniated portion of omentum was further fixed at the upper and lower limits of the space in the rectus sheath by catgut sutures put in from the peritoneal aspect. The abdominal wound was then closed by through-and-through sutures of silkworm gut.

The patient stood the operation well, and for a week thereafter gave no cause for anxiety. On the seventh day, however, he passed a large quantity of altered blood by the bowel, and this continued on the four succeeding days. After this he improved daily, and left hospital on 31st August, twenty-six days after operation, "feeling better than he had done for years." Within two weeks of leaving hospital he started work and has been constantly employed for the past five months.

His girth measurement at the umbilicus before operation was 37 ins., on leaving hospital it was 32 ins.

Seen on 16th January 1911 patient looks ten years younger than he did in August of last year. He has been in good health since leaving hospital; he works frequently 16 hours in the day without feeling fatigued. He has been teetotal for six months, has been twice promoted, being now senior ship's officer in a large passenger boat. His bowels act daily without medicine.

There is now no trace of cyanosis; the abdomen is much reduced in size, measurement at umbilicus  $29\frac{1}{4}$  ins., and no signs of fluid

in the abdomen are present. There is a small hernia at the abdominal wound, and enlarged subcutaneous veins can be seen coursing upwards from the right side of the epigastric region on to the chest.

*Further report, 25th February 1911.*—Slight return of ascites.

## MEETINGS OF SOCIETIES.

### Edinburgh Medico-Chirurgical Society.

A MEETING was held on 1st February, Dr. Byrom Bramwell, President, in the chair.

Professor Caird showed a patient after removal of a retroperitoneal dermoid. The tumour was adherent to and obstructed the left ureter, which was divided and repaired by end-to-end anastomosis. Professor Caird also showed a patient after removal of a carcinoma of the rectum by the abdomino-sacral method.

Professor Alexis Thomson showed a boy, aged 13, who had been run over by a motor car. There was sickness with hæmatemesis and hæmaturia, but apparent recovery took place. A month later sickness and abdominal swelling appeared; this was due to an accumulation of fluid in the lesser sac. An escape of the fluid into the greater sac followed. Both sacs were incised and drained. Two months later an accumulation recurred in the lesser sac.

Drs. D. W. Currie and Edwin Bramwell communicated a paper on "Epidemic Poliomyelitis." They pointed out that there had been a series of epidemics throughout the country in the last ten years. They described the chief features of a small epidemic which they had observed last autumn. The cases occurred in an isolated group of five houses in a country district. The source of the outbreak could not be determined, but it seemed certain that the infection had been carried from one house to another by one of the mothers. The incubation period was four days. It was suggested that there is a connection between anterior poliomyelitis and epidemic cerebro-spinal meningitis, since epidemics of the one seemed to follow the other as had happened in New York.

Dr. Melville Dunlop agreed that an epidemic had recently existed—there had been forty cases within the last six months at the Royal Hospital for Sick Children. The epidemic had been widespread and the symptoms had been unusually severe. There were prolonged and severe premonitory symptoms. In some cases the early symptoms resembled those of tuberculous meningitis. Other features were the older age incidence than usual, the widespread nature of the symptoms, and, in general, a more complete degree of recovery than was usual in sporadic cases.

Dr. Harvie Pirie urged the importance of early diagnosis and the isolation of affected children. The symptoms indicated that the disease

began as a meningitis. At this stage an increased pressure of the cerebro-spinal fluid and an increase of lymphocytes might be helpful in diagnosis.

Dr. Dingwall Fordyce said that the peculiarity of the epidemic described had been the special severity of the disease in the older children. He thought that the incubation period had been fixed within too narrow limits.

Dr. John Thomson said that the seasonal incidence of epidemic cerebro-spinal meningitis in this country was in winter and early spring, while that of anterior poliomyelitis was in the autumn.

Dr. H. G. Langwill read a paper on "The Medical Examination of Employees," which will appear in the *Journal*.

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### Edinburgh Obstetrical Society.

THE third meeting of the session was held on 11th January 1911, Dr. Haultain, President, in the chair.

Dr. Haig Ferguson showed an unusual specimen of uterus with submucous fibroids, and a twin foetus acephalus was shown by Dr. J. W. Ballantyne.

#### LANDRY'S PARALYSIS OCCURRING DURING PREGNANCY AND THE PUERPERIUM.

A communication on a case of this condition, sent by Dr. Samuel Davidson, Kelso, was read by the secretary. The patient, æt. 41, had eight children, seven of whom were living, and no miscarriages. All pregnancies and confinements were normal except the seventh. Towards the end of the seventh pregnancy, i.e. about 15th December 1906, she began to complain of pains in her legs and feet, and had considerable difficulty in walking, and also suffered from troublesome vomiting. She was delivered on 6th January 1907 of a dead-born child, labour being easy and natural, without instrumental interference. Three days later she could not move her legs at all and still complained of pain in them. Within the next few days the muscles of the trunk and arms became progressively paralysed. She was quite helpless, unable to feed herself or turn in bed, or to move either hand or foot, and had wrist-drop and pointing of the toes. There was no paralysis of the muscles of respiration or deglutition. Retention of urine occurred during the first week and required the use of the catheter for four months. With the exception of the pain in the feet there was no disorder of sensation. There were no bedsores, and no electrical changes in the muscles, and not much wasting. In May 1907 improvement first showed itself in the arms, but the finer movements of the fingers were a very long time in being established. The patient



suffered from internal strabismus before her illness, but it became worse during her illness and improved as the paralysis passed off.

The patient became pregnant in September 1907, and was delivered of a living healthy child in June 1908. She informed Dr. Davidson that she thought she would not recover until she had another child, but whether this was an afterthought or not he did not know. Certainly this eighth pregnancy did not make the paralysis any worse, though it may have retarded her recovery. About September 1908 she began to walk with the aid of two sticks, and she continued to require the aid of a stick in walking until a few months from the time of writing (June 1910). At that time she suffered no pain but occasionally felt cramp in her arms and legs. There was apparently only one muscle then remaining paralysed, and that was the extensor proprius hallucis on the right side.

She was well nursed during her illness. The only medicinal treatment was the administration of arsenic and strychnine after the acute symptoms had subsided.

As regards causation, the writer was inclined to regard it as one of the toxæmias of pregnancy. The only reference in the literature at his disposal was in Church and Paterson's *Nervous and Mental Diseases*, page 367, where Dr. Church stated that "among other causes pelvic cellulitis, the puerperium, and obscure febrile disturbances have seemed to play a part in its inception." Dr. J. W. Ballantyne had been able to find for him only one reference, viz. F. Lewitton, "Landry's Paralysis Complicating Pregnancy," from the *North-Western Lancet*, Minneapolis, vol. xxii. p. 318 (1902).

The President and Dr. J. W. Ballantyne made remarks.

Dr. Berry Hart gave a communication, illustrated by a limelight demonstration, on the "Nature of Achondroplasia and Allied Variations." The paper, which was of an elaborate scientific character, embodied the views published in a letter by Dr. Berry Hart in the *Lancet* of 14th January, page 124.

Dr. Ballantyne, Dr. Barbour, Dr. Fordyce, Dr. J. Simpson, Dr. James Ritchie, and Dr. Cowan Guthrie took part in the discussion.

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## RECENT LITERATURE.

## CRITICAL SUMMARIES AND ABSTRACTS.

## MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.

## BLOOD-PRESSURE.

*Auscultatory Method of Determining the Blood-Pressure.*—To the methods of determining the blood-pressure generally practised, namely, the palpatory (Strasb rger, Ehret), the graphic (Janeway, Sahli, Gibson), and oscillatory (v. Recklinghausen), a distinctly new procedure was added by Korotkow in 1905. This, the auscultatory method, forms the subject of a paper (*Univ. Penna. Med. Bull.*, November 1910) by Goodman and Howell. If a stethoscope be placed over the artery below the cuff, after the manometer has been applied and the brachial artery compressed in the usual manner, and the air in the cuff gradually released, a remarkable cycle of events can be traced. First will be heard a loud, clear-cut, snapping tone—the first phase, followed by a succession of murmurs—second phase. The third phase begins with the disappearance of murmurs and the appearance of a tone resembling in a certain degree that of the first phase but less well marked; this soon becomes less clear in quality—fourth phase, and is followed by the disappearance of all sounds—fifth phase.

*Origin of the Sounds.*—First phase. Probably due to the sudden distension of the vessel walls by the in-rush of blood. Second phase. During the propulsion of blood from a vessel of small lumen to a vessel of larger calibre whirlpool-like eddies are produced. The factors necessary are small lumen, small pulse wave, lessened shaking of vessel wall, diminished rapidity of the blood-stream in the narrowed vessel. Third phase. The tone of this phase is less loud than that of the first, because, despite the increase of blood flowing through the vessel, the lumen is so much wider that the rapidity of the current is lessened and the tone less sharp. The fourth phase is transitional to the fifth, in which the normal calibre of the vessel is restored. By the auscultatory method the systolic pressure generally reads about 10 mm. higher than by others. Fischer has devoted much attention to the various phases and concludes that the third phase is the most important. In anemia the second phase is prolonged. In cases of cardiac weakness the second and third phases or either of them may be absent. Ettinger believes that absence of the third phase is a valuable sign of cardiac weakness; when the second and fourth phases are also absent it is a sign that the weakness is of severe degree. Goodman

and Howell have investigated the relation of these phases to the systolic and diastolic pressures. They regard a normal cycle as consisting of five phases, the systolic pressure being 130 mm. and the diastolic pressure 85. The phases bear a definite relation to the differences between the extremes of pressure, and average as follows (in millimetres):—

	Millimetres.	Percentage of Pulse Pressure (45 mm.).
First . . . . .	14	31.1
Second . . . . .	20	44.4
Third . . . . .	5	11.1
Fourth . . . . .	6	13.3
		<hr/> 99.9

The writers have endeavoured to ascertain whether pathological conditions are accompanied by variations in the length and character of the different phases, expressed as percentages of the pulse pressure. They cannot yet make final statements on this question, further than to say—(1) That for routine estimation of the systolic and diastolic pressures the auscultatory method is best. (2) That noting the phase is important in diagnosis. (3) That the auscultatory findings from day to day give therapeutic and prognostic guidance. Absence of the fifth phase (*i.e.* persistence of the tone) is pathognomonic of aortic incompetence. Arteriosclerosis with cardiac hypertrophy gives prolongation of the second and third phases. When under like circumstances there is no such prolongation, the circulation is functionally below par. The normal relation of the phases is altered in uncompensated mitral disease, and in myocarditis with failure of compensation. Arrhythmia can be detected earlier by the auscultatory method than by feeling the pulse or listening to the heart. It can be recognised, not alone by irregularity in tone, but by variations in the intensity of successive murmurs or tones, or by the alternative of murmurs and tones. The method may also be useful in differentiating organic and functional derangements. In a class of cases where organic lesions were known to be present repeated examination showed a uniformity in the sequence of the phases. As opposed to this group there is one presenting the same chain of symptoms in which no organic lesion could be discovered but in which the readings were characterised by marked variations in sequence relations. This irregularity is not confined to the individual phase, but there are variations in the systolic and diastolic pressures. These cases are probably neuroses.

*Estimation of the Diastolic Blood-Pressure by Palpation of the Brachial Artery.*—Ebret (*Mösch. med. Wochenschr.*, 31st January 1911) states that the diastolic pressure can be determined from the character of the pulse in the brachial artery during the time in which the air is being pumped into the cuff of the manometer. At a certain period

the pulse undergoes a change and becomes thumping—*pulsus celer*. The phenomenon can also be recognised in the radial artery, though to a less degree. Ehret's explanation of the phenomenon is: The interference with the circulation by the manometer cuff causes a general fall in pressure and consequent relaxation of the arterial walls throughout the distal part of the limb. The pressure throughout the whole distal part of the limb is equal. As each pulse wave travels down the arm and overcomes the resistance of the cuff it meets with an abnormally relaxed artery, hence the production of the *pulsus celer*. The phenomenon develops suddenly, not gradually, as the pressure in the cuff is raised; it can often be seen as well as felt. The alteration in the pulse is almost invariably to be detected. It coincides with the diastolic pressure as estimated by v. Recklinghausen's oscillatory method. The conditions below the cuff, which contribute to the production of *pulsus celer*, are essentially the same as those which cause the sounds described by Korotkow. Assuming that the clear tone (phase first of Korotkow) represents the diastolic pressure, Ehret's *pulsus celer* will be found to give exactly similar results. We have therefore three methods of estimating diastolic pressure—oscillatory, auscultatory, and palpatory—which all give identical results. Compared with Strasburger's method (noting the time at which the radial pulse becomes perceptibly smaller) palpation of the brachial gives lower and, Ehret believes, more accurate readings.

## SURGERY.

### URINARY SURGERY.

THE advances in urinary surgery, both from a diagnostic and from an operative point of view, have been so numerous of late that abstracts from some of the most recent papers on the subject may not be amiss.

*Supernumerary Kidney.*—Professor Dixon of Dublin (*Journ. of Anat. and Physiol.*, January 1911) describes a case met with in the class of practical anatomy in which a supernumerary kidney was found. It occurred in a male subject of about 45 years of age, in which no other congenital abnormality was noticed. It was situated below and completely separated from the left kidney; the ureter of the lower kidney joined that of the upper near its origin, forming a common duct which passed down to the bladder. In reviewing the literature of such cases, ten of which are mentioned, Dixon draws attention to the fact that a large proportion of those recorded were recognised in the course of surgical operations.

*Single Kidney.*—As a contrast Dr. Chance reports a case at the New England branch of the American Urological Association in which one kidney only was present. The patient was a boy 14 years of age, who



for five years had suffered from occasional chills and pain on urination. At the end of this period the symptoms became more pronounced, pus was found in the urine, and a tumour in the region of the right kidney was felt. It was thought that the left kidney could just be palpated, but this was found afterwards to be incorrect. The boy's friends refused operation, but a month later, after medical treatment proved futile, they permitted it. A transperitoneal nephrectomy was contemplated, but an examination of the left side of the abdomen failed to reveal the presence of a kidney, and right nephrectomy was, therefore, not possible. The abdominal wound was closed, and the right kidney exposed through a posterior incision. The kidney was 7 ins. long, and a large cyst composed its lower half. The cyst was removed, and the lower pole of the kidney was sutured to the twelfth rib, with the object of straightening the ureter. There is no note in the case of any preliminary investigation with the view of ascertaining the functional activity of the left kidney. A vaccine was given during convalescence, and four months later the patient was practically well, although there was still some pus in the urine.

*Estimation of Functional Activity of Kidney.*—In estimating the functional activity of the kidney, various drugs have been used with the object of testing their eliminative power. John R. Caulk (*Interstate Med. Journ.*, December 1910) gives an interesting summary of these. He condemns methylene-blue, as it has several disadvantages, among them the fact that the dye is altered in the system and excreted as a chromogen, only 50 per cent. being normally eliminated in the urine; indigo-carmin is discarded for the same reasons, only 25 per cent. being excreted by the urine. Other methods are mentioned, but the author strongly advocates the phenolsulphonephthalein test of Rowntree and Geraghty, on account of the fact that, while it is simple and accurate, it can demonstrate the impairment of the renal function when other tests fail. It has also been shown to be non-toxic and non-irritating. The method of carrying out the test is, shortly, as follows:—Twenty minutes before its administration the patient drinks from a tumbler to a tumbler and a half of water. In cases where the total renal function is desired a catheter is passed and the bladder is thoroughly emptied, then 1 c.c. of the solution, containing 6 mgrm., is administered subcutaneously, and the urine is drained into a test-tube in which a drop of a 25 per cent. NaOH solution has been placed. The time when the first pinkish tinge appears is noted. After this the catheter may be withdrawn if there is no prostatic obstruction, and the patient told to pass water at the end of an hour, and again at the end of two hours, but greater accuracy is ensured if the catheter is left *in situ* during that period. If the urine is acid a yellow colour is displayed, but if an alkali be added a brilliant purple is the result. The urine collected

during each hour is placed in a separate litre flask and distilled water added up to that quantity. The solution is thoroughly mixed and filtered; each hour's sample is then compared with the standard solution, which consists of 3 mgrm. of phenolsulphonephthalein (half the quantity injected into the patient) diluted up to a litre and made alkaline by a few drops of 25 per cent. NaOH. This standard solution is chosen because of the beautiful pink colour obtained when the indicator of the colorimeter stands at ten. Examples of the method are given, and numerous conditions in which the test is serviceable. The conclusions of Rowntree and Geraghty are then quoted, in which the advantages of the method over others are summed up. Should the absolute amount of work done by either kidney require to be determined, the use of a separator or of ureteral catheterisation must, of course, be employed.

*Lumbar Renal Fistula.*—At the meeting of the American Urological Association, previously mentioned, Dr. Watson showed a patient who had had a permanent lumbar renal fistula on the right side for nearly sixteen years, and who had during that time, with the exception of seven months, remained well and carried on his usual employment. He showed this patient because it had been stated by a prominent surgeon that death would be preferable to enduring the miseries entailed by the existence of a permanent lumbar renal fistula. The patient himself gave a very favourable account of his condition. The primary operation was performed for pyonephrosis of the left kidney and an obstructed ureter. Nine years later acute infection of the right kidney occurred. In both instances nephrostomy and the establishment of a permanent lumbar renal fistula was found necessary.

*Tumours of Renal Pelvis and Ureter.*—Jean and Paul Fiolle, in their article on new growths of the pelvis of the kidney and the ureter (*Gaz. des Hôp.*, 17th December 1910), describe practically all that is known of the condition at the present time. They note that until recently such growths were rarely recognised, and still less frequently was treatment attempted. It is now known that those tumours are not so rare as was at one time supposed. They are met with in adults, with the exception of the connective tissue tumours which are sometimes found in children. In all cases there is practically always some previous pathological lesion, usually of an irritative character. The varieties of tumours are described in detail, and it is shown that the papillomas recur by secondary implantation or grafting. This is the only variety in which operative interference can give hope of a more or less permanent cure, and then only if early and extensive operations are carried out. Nephrectomy, with possible ureterectomy, is the operation of choice if the functional power of the opposite kidney is found to be efficient.

*Removal of Ureteral Calculus.*—Cabot, in a paper entitled "Remarks on the Technique of Operations for Stone in the Ureter" (*Boston Med. and Surg. Journ.*, 24th November 1910), opposes some points recently advocated by Albarran and Jeanbrau, although admitting the value of their recent work on the subject. He starts by mentioning the three points where ureteral calculi most frequently lodge, and then describes the incisions which he believes to be most suitable for the exposure of the ureter at those situations. For stone in the lowest portion of the ureter he considers the incision advised by Gibson much to be preferred to the curved incision usually employed. Gibson's incision starts in the middle line, a finger's breadth above the pubis; it runs transversely at first, nearly parallel to Poupart's ligament, and then, at mid-Poupart, curves sharply upwards, ending level with the anterior superior spine of the ileum. The oblique muscles are divided in the line of the incision, and, in the outer part of the wound, a few of the fibres of the internal oblique may have to be cut. The upper flap is then retracted, the outer border of the rectus muscle identified, and the fascia of the transversalis divided by a vertical incision close to the rectus and at right angles to the original incision. The peritoneum is then stripped back, and with good retraction, the patient being in the Trendelenburg position, a good view of the lower part of the ureter and bladder is obtained. Albarran and Jeanbrau have recently advocated cutting on the stone at the point of impact, as they believe that attempts to draw the stone up the ureter are likely to cause damage. Cabot denies this and points out that the ureter proximal to the stone is almost always dilated, and that therefore an incision at that point, followed by the passage of suitable forceps to extract the stone, is not only likely to do less damage than if the stone be directly cut upon, but owing to the dilation there is a greater possibility of suturing the opening without the chance of obstructing the lumen of the ureter, and that leakage is less liable to occur. After removal of the stone the patency of the ureter above and below must be tested. Albarran and Jeanbrau both recommend drainage of the pelvic kidney by a catheter after septic cases, and Albarran even advised it in aseptic cases. Cabot objects to such a method in either, and gives very good reasons for his conclusions; the last point that he argues is that of the universal custom of draining the abdominal wound down to the point of suture in the ureter, and gives notes of three cases, two aseptic and one septic, in which no after-drainage was employed, yet the results were excellent. He does not suggest that this should be a routine procedure, but asks that the method should be carefully considered.

GEORGE CHIENE.

### PRACTICAL POINTS IN THE TREATMENT OF OBSTRUCTION ASSOCIATED WITH PERITONITIS.

Kappis, writing from the clinique of Professor Anschütz, Kiel (*Munch. med. Wochenschr.*, No. 1, 1911), describes a method of continuous siphonage of stomach contents which has proved of great value in relieving patients suffering from obstruction associated with peritonitis. The method consists in passing a small stomach tube about the size of a No. 15 Jaques catheter through the nose into the stomach and attaching a siphon apparatus to the tube, which is fixed in position by any convenient means. The stomach contents are in this way easily and constantly removed, vomiting and eructation cease, and patients become much more comfortable. In addition, patients can drink freely with the tube in position, and although most of the fluid is quickly siphoned off, their distressing thirst is much relieved. The tube may be left *in situ* for about twelve hours; longer stay may cause soreness in the œsophagus, but if necessary the tube may be replaced after an interval without harm. The method has proved of great value in dealing with cases of acute dilatation of the stomach as well as in obstruction.

Kappis mentions also a convenient plan for controlling the flow from enterostomy openings which consists in introducing the horizontal limb of a T-tube into the bowel through the fistula and clamping the vertical limb. The tube is easily made from two pieces of rubber drainage tubing of the same bore as the fistulous opening, and when introduced conducts the intestinal contents past the fistula, and effectually prevents free leakage. If necessary a certain amount of leakage may be allowed by putting an adjustable clamp on the vertical limb. Kappis cites cases in which these measures were instrumental in saving life.

J. W. STRUTHERS.

### EPIGASTRIC HERNIA.

Fritsch (*Berlin. klin. Wochenschr.*, No. 1, 1911) records a rare case of epigastric hernia in which there were two protrusions, the upper one coming through an opening in the xiphisternum, the lower one through a gap in the linea alba. Operation showed that both swellings were outlying portions of the same properitoneal lipoma. The hole in the xiphisternum was closed by a flap from the right rectus muscle.

J. W. STRUTHERS.

### GLYCERINE AS A BLADDER LAXATIVE.

Franck (*Zentralbl. f. Chirurg.*, No. 2, 1911) publishes a short note on the value of glycerine in exciting contractions of the bladder.



Glycerine injections were first used by various surgeons as a means of preventing cystitis in cases of paresis of the bladder, with the result that they were found to stimulate the detrusor and cause parietic bladders to functionate again. Franck has made use of glycerine injections in a number of cases of post-operative bladder paresis with marked success. The injections were at first made through a catheter, but Franck has found that it suffices to inject 4 to 6 drachms of glycerine along the urethra with just sufficient force to overcome the sphincter. About half the injection returns when pressure is taken off the urethra, so that only a small quantity actually reaches the bladder. An injection is usually followed by spontaneous urination within twenty minutes, and once relieved, the parietic condition does not tend to return.

J. W. STRUTHERS.

#### ON SUBCUTANEOUS AND INTRAVENOUS FEEDING WITH GRAPE SUGAR BY KAUSCH'S METHOD.

Berendes (*Zentralbl. f. Chirurg.* No. 37, 1910) states that it has been the practice in Kausch's clinique for some time to add grape sugar to infusions of saline solution in cases in which patients have been unable to take nourishment by the mouth. The solution has been given subcutaneously or intravenously, and over forty cases have been so treated. The sugar is mixed with normal saline solution in the strength of 5 to 7.5 per cent. When given subcutaneously it causes no more pain than an infusion of saline alone, though its absorption is rather slower. Intravenous injections do not cause pain, but patients sometimes complain of a feeling of warmth and general discomfort during the injection. When the amount injected does not exceed 50 grms., *i.e.* 1 litre of a 5 per cent. solution, sugar does not appear in the urine unless the injection is repeated on several successive days, and even then only a very small amount is excreted, approximately 5 per cent. of the whole amount injected. The method apparently offers a safe means of supplying 200 to 300 calories daily to patients unable to take nourishment by the mouth.

J. W. STRUTHERS.

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#### OBSTETRICS AND GYNECOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.,  
Physician, Edinburgh Royal Maternity Hospital, &c.

#### TREATMENT OF INOPERABLE CANCER OF THE CERVIX, UTERI, AND VAGINA.

DRS. CHERON and Rubens-Duval (*L'Obstétrique*, N. S. iii. pp. 728-743, 1910) regard the introduction of Domenici's method of applying radium

as an epoch-making event in the history of radiumtherapy in cervical and vaginal cancer. Domenici's method of far-penetrating radiation by radium (*rayonnement ultra-pénétrant du radium*) by means of the special tubes devised by him had given remarkable results: the pain, the foul discharge, and the hæmorrhage had diminished or disappeared, and in one case he had even been able to make an inoperable case of cervical and vaginal cancer operable,—hysterectomy which had been impossible in August 1908, being able to be performed in December of the same year. At first Chéron and Rubens-Duval followed Domenici's plan of making the applications of radium for a period of from 12 to 24 hours or longer, with intervals of from 3 to 5 weeks, using for each application from 5 to 8 cgrms. of radium. Encouraging improvement in symptoms followed as a rule; but they were gradually led to employ larger (massive) doses (20 to 30 cgrams. of bromide of radium), being convinced that although both strength of dose and duration of application were important, the former was the more important. In fact they now regard the use of massive doses as the indispensable complement of the method of far-penetrating radiation. A special technique was rendered necessary if these large doses were to be given safely, and the details thereof are fully described in the article which is being abstracted; all the rules of asepsis, also, have to be rigidly followed. At first the operators feared too marked a reaction, and put ice on the abdomen of the patient, but they found after a time that this was unnecessary. Domenici's tubes were placed inside the cervical canal, and as the quantities of radium employed were increased it was found necessary to increase the filtration. Fifty patients suffering from inoperable cancer were treated; of these 31 had too extended lesions or were insufficiently dealt with (*i.e.* had doses given to them afterwards recognised as too small) to give more than signs of amelioration; but of the remaining 19 patients all save one showed satisfactory results. The one patient who exhibited little improvement had large but not massive doses, and was perhaps refractory to the action of radium. The remaining 18 patients all showed cicatrisation of their lesions. The mode of action of the radium is to substitute for the epitheliomatous tissue a sclerotic one. The authors regard the use of radium in relation to surgery under two headings: (1) In operable cases the proper treatment is, of course, operation; but even in some of these it might be well to employ the radium in order to arrest the cancerous process and so make the operative interference easier and more effective. (2) In inoperable cases the radium treatment is the sole resource. In borderline cases Wertheim's operation alone gives cures, and it is still a serious operation, and cannot guarantee absence of recurrence. Radiumtherapy in such inoperable cases is capable of causing a considerable reduction in the size of the neoplasm, of transforming it into

fibrous tissue, and of cicatrising the ulcerations. The surgeon will find later operative procedures rendered much easier by this treatment, and the radiumtherapy, on the other hand, can be facilitated by preparatory surgical procedures such as curettage (*e.g.* in cases of cauliflower growth filling the vagina) or dilatation of the cervical canal. In this way surgery and radiumtherapy are mutually helpful in cases of cervical and vaginal cancer. Minor surgical procedures in operable cases make it possible to apply the radium more thoroughly, and the radiumtherapy in its turn may make an inoperable case an operable one (*e.g.* by hysterectomy). Further, even if, unfortunately, hysterectomy is followed by recurrence, the radiumtherapy may yet once more do good.

#### RADIUMTHERAPY IN BLEEDING FIBROIDS OF THE UTERUS.

Dr. Chéron, one of the authors of the paper above epitomised, has also written on radiumtherapy in bleeding uterine fibroids (*La Gynécologie*, ann. xiv. pp. 415-424, 1910). Using Domenici's far-penetrating radiation by means of radium (*le rayonnement ultra-pénétrant du radium de Domenici*), he has obtained good results. In a typical case, viz. a small interstitial fibroid in the anteverted uterus of a woman not yet near the menopause, Dr. Chéron employs a Domenici tube (one allowing the passage of only  $\beta$  (hard) and  $\gamma$  rays, by reason of filtration through  $\frac{5}{16}$  of silver) containing sulphate of radium; this is introduced into the cervical canal, its upper end not going beyond the isthmus, but in quite exceptional cases it may be placed inside the body of the organ. To obtain rapid hæmostasis .05 gr. of pure sulphate of radium is left in position for from 6 to 8 hours, and this procedure is repeated about 12 times, with intervals of 2 or 3 days. The action may be supplemented by flat appliances placed on the abdominal wall, and containing about the same quantity of the radium salt, the rays of which have to pass through a filter of 2 mms. of lead. Slight variations in the technique are made for dealing with fibroids in a retroverted uterus, with subperitoneal fibroids, with large inoperable ones, and with cases in which the cervix is so sclerosed that the tube cannot be passed in. The results of the treatment have been twofold. The checking of the bleeding in small fibroids is easily effected, two months sufficing, and Dr. Chéron obtained such a result even in cases which had been previously repeatedly curetted with no success. In some cases the menopause was established, and in others there was simply a checking of the menorrhagia. There was always difficulty in obtaining hæmostasis in the large fibroid uterus. The second result is diminution in the size of the growth, and as the radium rays do not appear to influence fibrous tissue directly it must be regarded as due to the effect on the vessels. The decrease in size, therefore, is delayed.

The indications for using radiumtherapy in uterine fibroids are thus grouped by Chéron: (1) In the case of serious accidents which necessitate rapid hæmostasis, *e.g.* women suffering from bleeding fibroids in whom surgical interference is contra-indicated on account of grave anæmia or cardiac or renal disease; and (2) in patients whose fibroids do not call for surgical interference, or, at any rate, do not require hysterectomy or myomectomy. If radiumtherapy be properly used it has no dangers—indeed there would be no justification in recommending it if it had any. The risks of excessive reaction, resulting in vaginal or intra-uterine radiumdermitis are small if the Domenici tube is properly surrounded with tarlatan to prevent secondary radiation.

#### INTRAVENOUS INJECTION OF CORROSIVE SUBLIMATE IN PUERPERAL INFECTION.

S. Polizzotti (*Annali di ostetricia e ginecologia*, ann. xxxii. vol. ii. pp. 445-486, 1910) sketches the history of the use of intravenous injections of corrosive sublimate in cases of puerperal fever from the year 1893, when the practice was introduced by Baccelli, up to the present time. The good results obtained by D'Erchia had not always followed in the hands of other observers, and some obstetricians had feared that evil effects would ensue in the kidneys. The writer records four cases in which this plan of treatment was carried out and in all of which recovery followed; careful bacteriological researches were carried through. The good effect was regarded by Polizzotti as due to three kinds of action: in the first place the opsonic index was raised, the opsonising substance producing such changes in the bacteria as rendered them phagocytatable and less resistant; in the second place leucocytosis was stimulated; and in the third the corrosive sublimate acted in an antitoxic way. The small number of cases, however, prevented the author from stating his belief in more confident terms.

#### VAGINAL FIBROMYOMATA.

Professor Emilio Alfieri (*Annali di ostetricia e ginecologia*, ann. xxxii. pp. 185-204, 1910) gives details of two cases of fibromyoma of the vagina which throw some light upon the origin of such tumours in this vicinity. In one of the patients the tumour affected the urethro-vesico-vaginal septum, was of the size of a turkey's egg, and had an elastic but non-cystic consistence; the catheter passed easily into the bladder above the tumour. It was easily removed, and the rest of the operation resembled an anterior colporrhaphy; under the microscope it was found that it was a simple myoma. In the other patient, a married woman who had had no children (the previous patient had one child eleven years before), the tumour, which was of the size of



a mandarin orange, lay in the posterior vaginal wall; there was a congenital retro-lateroversion of the uterus to the left side, along with endometritis and cervical stenosis. The tumour was enucleated cautiously but without difficulty, and at the same time the cervix was divided and the interior of the uterus curetted. The tumour was a fibromyoma of the vaginal walls, which had evidently originated in the fibro-muscular substance of these walls and gone on growing in their thickness. In this respect it differed from the former tumour, which had no relation save that of contiguity with the tissues of the anterior vaginal wall. Alfieri is of opinion that the last-named growth had a Gartnerian origin.

#### PREGNANCY IN THE BLAZEK SISTERS.

Dr. F. Mirto (*Annali di ostetricia e ginecologia*, ann. xxxii. pp. 374-387, 1910) comments upon certain phenomena in the labour by which the pygopagous twins (Rosa Giuseppa Blazek) gave birth to a child. These twin sisters were united by the sacral and iliac bones in such a fashion that the two vertebral columns formed a V. The two pelves had nearly the same measurements, and the mammary glands were normally developed. The genito-urinary organs opened in a common triangular space which was separated from the single anal orifice by the perineum. The coccyx could be felt to be single. The external genital organs had a triangular shape. There was a single clitoris and a single urethral orifice in a common vestibule; but although the vulva was single there were two separate vaginal canals. From physiological signs it was evident that the rectum was single for a considerable distance up, and that there were two bladders. The pregnancy of one of the sisters terminated in a natural labour, and during the puerperium there was milk in the mammary glands of both sisters, in fact the secretion was more marked in the one who had not been pregnant. During pregnancy the non-pregnant sister continued to menstruate and her general nutrition was unaffected, whilst the pregnant sister lost flesh. These interesting phenomena in parabiosis (as the peculiar semi-common life of a pygopagus may be called) throw some light upon the causes of mammary activity in pregnancy and seem to show that they differ from the causes underlying the general nutrition of the body as a whole.

#### THE ABDOMINAL INCISION IN CÆSAREAN SECTION.

Dr. Asa B. Davis (*Amer. Journ. of Obstetrics*, lxii. pp. 978-996, 1910) refers to 59 Cæsarean sections performed in the Lying-in Hospital, New York, between November 1908 and August 1910; 5 mothers died and 5 children, a mortality of a little over 8 per cent. in each (it was not exactly the same, for there were two sets of twins). At first in a

few cases the operator delivered the uterus from the abdomen before opening it, but in the great majority of the patients the organ was opened *in situ*. Gradually the size of the skin incision was reduced and its position was placed higher in the abdominal wall. In November 1904 Davis first practised the small high median incision entirely above the umbilicus, and this plan he now follows entirely. The length of the incision is from 8 to 10 cms. ( $3\frac{1}{4}$  to 4 ins.), beginning above and terminating at the umbilicus; it is explained that this is sufficient, because the abdominal wall is thin at this place and stretches easily. One or two gauze pads are placed in the abdomen to keep back the omentum and intestines, and the assistant, with his hands external to the abdomen, squeezes the uterus forward into the wound. The uterus is opened by a median incision in its anterior surface, beginning just below the fundus and proceeding downwards; it is made slightly longer than that in the skin. The hand is passed into the uterus, the anterior thigh of the foetus is grasped and the child delivered breech first. The rest of the operation follows the ordinary lines, and the abdominal wound is closed in three layers. The advantages claimed are less liability to hernia formation and to adhesion between the abdominal and the uterine wound; further, the abdominal contents do not easily escape at the time of operation.

### PATHOLOGY.

By THEODORE SHENNAN, M.D., F.R.C.S.,  
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#### SOME PRACTICAL APPLICATIONS OF THE THEORY OF ANAPHYLAXIS.

UNTIL recently the term "anaphylaxis" conveyed to others than those specially engaged in the investigation of the phenomenon a vague idea of a something which is connected with serums and immunisation by means of serums. This vague conception is now condensing into more material form, and anaphylaxis is becoming recognised as a very real danger which has to be guarded against in serum therapy.

Even at the risk of repetition it is advisable to explain shortly what is now conceived to be the nature of the phenomenon.

Anaphylaxis is an over-sensitiveness of the animal organisation to the presence of foreign proteins, which have entered it without in the first place undergoing modification in the alimentary canal.

Von Pirquet and Schick of Vienna were the first who observed and investigated the condition.

An experiment detailed by Friedberger, from whose paper (*Monch. med. Wochenschr.*, 1911, No. 50, 51) the greater part of what follows is

culled, is of use, as it demonstrates the phenomena which characterise anaphylaxis.

Guinea-pigs of a certain weight were "prepared" by inoculating subcutaneously 1 mgrm. (0.001 grm.) of *sheep* serum. Now normal guinea-pigs of similar weight can bear subcutaneous injection of 20 c.cm. of sheep serum (20,000 times as much) without any apparent ill effects. If the "prepared" animals were injected with 5 c.cm. of *horse* serum, even so late as to the seventh day after the primary injection, only transient bad effects were apparent, whereas a "prepared" animal died within five minutes after receiving intravenously on the tenth day an injection of 5 mgrms. of *sheep* serum, *i.e.* a four-thousandth of the amount which a normal, unprepared animal can safely receive.

This over-susceptibility to re-injection of any foreign, under ordinary conditions, indifferent, protein is designated anaphylaxis.

All warm-blooded animals may be rendered anaphylactic, and the condition may persist for years. Man, fortunately, is not so highly susceptible as some other animals. Anaphylaxis, as is indicated also by the above experiment, is strongly specific. Passive anaphylaxis can be brought about by injecting normal animals with serum from a sensitised animal, and the foetus *in utero* can be sensitised from the mother.

Friedberger regards the "antibody" produced in response to the injection of the protein as related to "precipitins" and to complement-deviating antibodies. He claims that the toxic effect in the animal body is brought about by the interaction within the blood of three substances—protein, antibody to the protein, and complement; that the complement splits off from the protein-antiprotein combination a poisonous substance or "anaphylatoxin."

The reaction can be demonstrated *in vitro*. If horse serum be mixed in a test-tube with serum of an animal treated with that serum a precipitate results. The precipitate is washed thoroughly with saline solution so as to free it from all trace of the serum. If it be then added to normal fresh (*i.e.* complement-containing) guinea-pig serum, it produces anaphylatoxin. This is shown by centrifugalising this last treated serum, so as to remove all the precipitate. The supernatant fluid, if injected into an animal of the same species as that first treated, kills it in a few minutes.

Friedberger believes that his conception of anaphylaxis is fitted to explain certain common abnormal conditions which are usually looked upon as personal idiosyncrasies.

Amongst these are the idiosyncrasies towards certain foods which contain albumen. In certain disorders of digestion traces of food albumen may escape unaltered into the blood. Rosenau and Anderson by feeding guinea-pigs with excess of egg albumen succeeded in making them susceptible to this albumen when given by inoculation.

The idiosyncrasy of some children towards cow's milk is of anaphylactic nature, and means that an antibody to bovine albumen (protein) is present in them primarily, or that this is formed at an early period of life owing to escape, during gastro-intestinal derangements, of milk albumen directly into the blood, where anaphylatoxin is formed as already described in the case of blood serums. Putting the child on the breast causes the troubles—fever, vomiting, diarrhoea, asthma, and collapse—to disappear. Similarly, anaphylaxis may develop towards egg albumen, but this is usually lost in later life, possibly from the intestinal wall becoming less permeable.

Susceptibility to horse serum is of importance in view of the therapeutic employment of sera. This susceptibility may be present primarily, but more often is developed as a result of inoculation of a protective serum. On re-inoculation the signs of anaphylaxis may appear—cyanosis, convulsions, or asthma and dyspnoea, with, it may be, death.

Friedberger gives an illustrative case of a medical practitioner who was so susceptible to horse protein that he could not employ horse conveyances unless they were closed, the particles of horse protein conveyed upon hairs or skin epithelium being sufficient to bring about asthma and dyspnoea. He could not enter a stable without suffering, but could go into cow-sheds with impunity. This individual once received a small prophylactic dose of diphtheritic serum. It caused for the time severe illness—asthma, dyspnoea, cough, rise of temperature, great lassitude—but within two hours he recovered, with the further interesting result that he was immune to horse protein for three months, the injection having developed antianaphylaxis, and abolished his hypersusceptibility.

It is clear that if re-injection of a serum is necessary, for example, in treating diphtheria in human beings, small quantities of a serum rich in antitoxin should alone be employed, but other means of avoiding the danger are available. Thus serum which has been stored for a long time is less toxic than fresh serum. Heating to 55 to 56 C. on several successive days weakens the toxicity without damaging the antitoxic powers of the serum.

Ascoli uses for prophylactic injections antitoxic sera prepared by injecting sheep, so that if diphtheria break out the valuable horse serum preparation can then be employed. Netter administers by the mouth chloride of calcium, in doses of 0.1 to 1.0 gm. for three days, before giving a re-injection. Bligh uses calcium lactate. The best means available, however, is to give a minute dose of the serum on the day previous to that on which the antitoxic dose is to be repeated (Neufeld, Besredka). Thereafter even intravenous injection is without risk, antianaphylaxis having been developed by the previous small injection.

Hay fever also is claimed to be a true anaphylactic disease, the



protein concerned being that contained in the pollen of certain grasses (*adoxantum odoratum*). In susceptible individuals Wolff-Eisner has produced anaphylaxis by subcutaneous injection of pollen protein at the special time of year at which attacks occur. Seeing that hay fever does not occur in children, and appears first during the second decade of life, one has to do, not with a congenital peculiarity, but with an acquired hypersusceptibility, the penetration of the pollen protein during the earlier years of life having developed antibodies to that substance.

Eclampsia is another disease which is explained on somewhat similar grounds. Amniotic fluid absorbed during pregnancy acting as antigen "prepares" the individual, and increased absorption at the confinement releases the toxic materials. Guinea-pigs can be rendered passively anaphylactic towards human amniotic fluid by injecting them with the blood-serum of an eclamptic woman.

In hydatid disease the patient develops antibodies in consequence of absorption of small quantities of the proteins of the parasite. When such patients are operated upon for drainage of the cysts they may absorb small amounts of hydatid fluid by way of the peritoneum and severe symptoms of toxæmia appear, which run a course characteristic of anaphylaxis.

The nature of idiosyncrasies towards iodoform, quinine, and other drugs is still completely unknown. The reader may be referred to Friedberger's paper for further details and for a somewhat involved discussion of the resemblances and relationships between anaphylaxis and immunity.

#### "ANTIFORMIN."

In a previous digest of Recent Methods for Demonstrating the Tubercle Bacillus (September 1910), the "antiformin" method of concentrating the bacilli in fluids and discharges was described. This proprietary article is expensive, and a non-expensive and satisfactory equivalent is now available. Goodman (*Proc. Path. Soc. Philadelphia*, September 1910) gives the composition of the fluid he uses: 150 grms. of calcium hypochlorite are thoroughly triturated with 200 c.c. water, added gradually, until a uniform mixture results. After standing a short time to allow the heavier particles to settle, the supernatant fluid is filtered off, the residue treated with 200 c.c. water, and the whole transferred to the filter. When the liquid has filtered off, the residue is washed with 100 c.c. water. 150 grms. of sodium carbonate are dissolved in hot water and added to the filtrate, as obtained above. The mixture is thoroughly stirred, and if it should become gelatinous, it is warmed until the contents become liquefied. The whole is transferred to a new filter, and when the water has filtered off the residue is washed with enough water to make the product weigh (measure is

accurate enough) 1000 grms. (1000 c.c.). Thirty grms. of sodium hydrate are now added, and the mixture kept in brown bottles with rubber stoppers and protected from the light.

This solution contains a little more chlorine and almost the same amount of sodium hydrate as antiformin, and as already said, its action is practically identical.

*Gasís' method* of staining for tubercle, which depends on the "alkali-fastness" of the tubercle bacillus, was also discussed. The method allows of its differentiation from the smegma bacillus.

The details are as follows:—3 grms. of mercuric chloride are dissolved in 95 c.c. of distilled water and 5 c.c. of alcohol by the aid of heat; 1 c.c. of cedar-wood oil is added, and the mixture boiled until it becomes white and somewhat thick. It is filtered while warm, and a solution of 1 gm. of eosin (yellowish) in a few c.c. of water is added. The mixture is filtered after cooling, allowed to stand for twenty-four hours and again filtered. The reagent may keep for weeks. To remove the excess of stain a solution of 1 gm. of sodium hydrate and 0.5 gm. of potassium iodide in 100 c.c. of alcohol (50 per cent.) is used.

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## OPHTHALMOLOGY.

By ANGUS MACGILLIVRAY, C.M., M.D., F.R.S.E.,

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### THE TREATMENT OF TRACHOMA-GRANULAR CONJUNCTIVITIS.

FOR the past twenty years or so the method of treatment generally adopted at the outset in dealing with this troublesome and chronic affection has been to get rid of the gelatinous contents of the granules found on the conjunctival surface of the palpebral and transitional conjunctiva by operative procedure. This is generally carried out by means of a Knapp's roller forceps or some modification of that instrument. With the forceps the contents of the granules can be expressed in a wholesale manner with the least destruction of conjunctival tissue, which obviates to a very large extent the risk of subsequent cicatricial contraction so frequently met with in the later stages of the affection. By means of frequent instillations, extending over a period of twenty-five minutes, of a 5 per cent. solution of the hydrochlorate of cocain, to which a few drops of a 1 in 1000 adrenalin chloride solution have been added, the operation can be accomplished in a very few minutes' time, with practically little or no pain. Care should, however, be taken that after each instillation of the cocain solution the patient keep his eye-

lids closed to prevent the desiccation of the corneal epithelium which follows the use of this drug should the cornea be left exposed.

The treatment of granular lids by expression is not a recent one, for about a hundred years ago the individual granules were treated in this manner between the thumb nails of the surgeon, a method not only tedious but undignified. By means of the roller forceps the granules can now be expressed easily and thoroughly in a very few minutes.

When the expression is completed a solution of 1 in 500 perchloride of mercury is forcibly rubbed into the expressed conjunctival surface by means of a mop of cotton-wool wound round the end of a strong glass rod, the object being (as was once supposed) to destroy any bacterial or parasitic life believed to be the etiological factor. The patient after leaving the operating theatre is put to bed and iced compresses are continuously applied over the closed eyelids for some twelve hours to keep in check the inflammatory reaction which invariably follows this apparently rough handling of the conjunctival membrane.

Some five years or so ago the writer discontinued the use of iced compresses after the operation of expression, believing that the greater the inflammatory reaction following the operation the more beneficial the results. He was prompted to employ this expedient of encouraging rather than retarding inflammatory reaction after the operation on the ground of the beneficial results found after the use of jequirity. In the Brazils an infusion of jequirity (Paternoster bean) was used by the natives for a very long time in the treatment of granular conjunctivitis. An infusion of the bean was applied vigorously twice a day for three days to the everted eyelids, with the result that a severe conjunctivitis was produced. It resembled a croupous conjunctivitis, and was attended by marked swelling of the lids, great pain, and constitutional disturbances. The results obtained from this drastic treatment were generally satisfactory so far as the trachoma was concerned, but in some instances a violent blenorrhœa of the conjunctiva supervened, followed by more or less destruction of the cornea and eyeball. Our vigorous treatment of rubbing a 1 in 500 perchloride solution into the expressed conjunctiva can, at all events, be justified empirically, and as regards danger to the cornea from its use, our experience is negative. Jequirity, it may be mentioned in passing, is not used by surgeons nowadays as formerly, because the active principle of the bean jequiritol has been isolated, and can now be procured commercially. It can be standardised, and is therefore less dangerous than the parent remedy, although not altogether free from the risk of causing corneal complications.

On the day following the operation the eyes are freely bathed with a solution of 1 in 4000 perchloride of mercury three times a day, and this treatment is continued for a few weeks when the inflammatory

symptoms following the operation will have subsided. It is at this stage of the treatment that the use of the solid sulphate of copper should be begun. It should be applied daily to the affected conjunctival surfaces, and continued for several months if lasting results are to be obtained.

The above line of treatment modified from the old, when conscientiously practised both by the surgeon and the patient, is in the opinion of the writer most satisfactory. No doubt all cases thus treated do not remain permanently benefited by treatment, for a few show a tendency to relapse every now and then.

As regards the prevention of sequelæ, such as entropion, trichiasis, and pannus, the writer is under the belief that these are not so commonly met with since the expression perchloride and copper treatment has been adopted, but as these sequelæ generally come on years after the disease has been acquired, it would be premature to dogmatise on this point.

H. H. Martin (*Ophthalmology*, January 1911) reports on sixty cases of trachoma treated after Coover's method. This method may briefly be described as follows:—The eyelids are everted and the conjunctiva thoroughly scrubbed with sandpaper which has been previously sterilised by pouring alcohol over the surface, setting fire to the alcohol and allowing it to burn off. Martin had the pleasure of seeing Coover operate by this method in June 1909; prior to that time he had employed Noyes's forceps for the operation for trachoma. Martin does not agree with Coover that the sandpaper operation was sufficient in itself to cure this disease, his observations having been that copper sulphate or some other specific for this disease is essential to complete a cure after any of the surgical measures.

In the late summer of the same year Martin discovered sixty cases of trachoma among ninety-eight boys, inmates of an orphan home near Savannah. He divided these sixty cases into four groups of fifteen each. The first fifteen were treated after Coover's method unmodified, the remaining were treated after the Coover's method modified as follows:—Instead of burning alcohol or making any other attempt to sterilise the sandpaper he used the sandpaper just as it came from the shop, but immediately after the operation the conjunctival sac was copiously irrigated with normal salt solution in order to clear the sac of any loose grains of sand; the lids were then everted and thoroughly scrubbed with gauze sponges and a 1 in 5000 perchloride of mercury solution (this was also done in the first fifteen). In the entire sixty cases there was no evidence of infection having occurred during the operation. Any attempt therefore to sterilise the sandpaper was, in the author's opinion, troublesome, unsatisfactory, and entirely unnecessary. Immediately after the operation Martin's patients were kept in bed until they had recovered from the anæsthetic, but no dressings or



local applications were employed. In every instance the boys were in their places in the schoolroom the next day after the operation. The first group of fifteen had no after-treatment of any description ; in the remaining forty-five a saturated solution of copper sulphate (40 grs. to the ounce) was dropped into each eye once a day for eight weeks. Ten months after the completion of this series of operations these sixty cases were all carefully examined for trachoma, with the following results :—

In the fifteen cases which were treated strictly by the Coover method without after-treatment there were twelve recurrences (80 per cent.). In the forty-five cases where the copper sulphate was used as above described there were but six recurrences (13 per cent.). In a note the author explains that these operations were all done in the dormitory of the orphan home, no operating table being available, and that the after-treatment was carried on by very inexperienced attendants. Had the after-treatment been carefully and thoroughly carried out there is every reason to believe that there would have been no recurrences in these cases in which copper sulphate was employed after operations.

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## THERAPEUTICS.

By F. CHARTERIS, M.D.

### AN IMPROVED METHOD OF ASPIRATING THE PLEURAL CAVITY.

HOLMGREN suggests an improved method of removing fluid from the pleural cavity. Instead of the ordinary method by syphon action or aspiration he displaces the fluid by air. To effect this two punctures are used. The lower puncture is made in the tenth interspace midway between the posterior axillary and the scapular lines. This cannula is connected with an ordinary syphon tube to remove the fluid. One interspace higher a second cannula is introduced which is connected with a wash bottle or other flask half filled with water and furnished with a rubber cork through which pass a short glass tube and a longer one reaching to the bottom of the flask. The short tube is connected to the cannula, and the long glass tube, which projects below the surface of the water, is connected with a syringe or rubber spraying bag by which air can be pumped into the chest. In tapping the chest the fluid, which is under considerable pressure, at first flows freely through the lower cannula, when the flow becomes intermittent, or if the patient experiences any discomfort from dyspnoea, pain, coughing, &c., a little air is pumped in by the upper cannula, which promptly removes all discomfort and causes the fluid to run freely through the lower cannula. In this way, by gradually introducing air to replace partially the fluid

removed, it is possible to withdraw almost the very last drop of the effusion without in any way embarrassing the patient. Eventually a pneumothorax is left in place of the effusion. The air left in the pleural cavity is gradually absorbed, and the lung slowly expands without being subjected to any sudden decompression strain. By repeating the introduction of air at regular intervals it is possible to keep the lung more or less compressed and out of action, a procedure which has been advocated in the treatment of certain forms of pulmonary tuberculosis. The chief advantages claimed for this method of aspiration are that the effusion is thoroughly removed and that the patient suffers no discomfort during the removal. The presence of the air inside the pleura exercises no deleterious influence. At the end of the aspiration the pressure on the surface of the lung is equal to the pressure inside the lung, and is less than that exerted by the effusion. Consequently the lung, by the end of the aspiration, has already expanded somewhat, and as the air is absorbed the lung gradually expands further. The procedure is particularly advised in cases of purulent effusion, *e.g.* in pyopneumothorax or tuberculous empyema, when it is advisable to remove all the effusion without subjecting the diseased lung to undue strain. Holmgren has used the method thirty-three times in seventeen patients. The only reaction is a slight increase in the pulse-rate for the first few days, and occasionally a slight degree of fever. Instead of air, oxygen may be introduced, which is more rapidly absorbed than the nitrogen moiety of air.

#### INFLUENCE OF DIFFERENT GASES ON PLEURAL EFFUSION.

The influence of different gases upon the evolution of pleural effusions produced by injection of aleuronate has recently been studied by Lippens (*Travaux de l'Institut de thérap.*, Brussels, tome viii. 1910) on dogs. He finds that the various gases have slight differences in effect, but in all cases tend to hasten the removal of the effusion. The gases most rapidly absorbed are O and CO<sub>2</sub>, while atmospheric air and N are more slowly absorbed. All these gases, with the exception of N, hasten the development of the effusion after the injection of aleuronate, and in the case of N the resulting effusion is rather more copious than when aleuronate alone is used, but the other gases, notably O and CO<sub>2</sub>, distinctly diminish the amount of the effusion. An influence is also seen on the leucocytic content of the effusion which, with O, CO<sub>2</sub>, and air, develops much more rapidly and reaches a greater degree, whereas N somewhat delays the appearance of leucocytes in the aleuronate exudate. In the case only of O and CO<sub>2</sub> is phagocytosis increased.

## ARTIFICIAL PNEUMOTHORAX IN PHTHISIS.

The proposal to treat phthisical cases by producing an artificial pneumothorax with the view of throwing the diseased lung out of action is of very doubtful value. It has been tried a good deal in Norway and Denmark. Saugmann (*Ugeskr. f. Læger*, 1910, S. 269) lays down the following rules and indications:—It should only be employed in the case of patients with one lung badly affected. The other lung must either be free from disease or at least have no active disease going on, but an old inactive lesion is not necessarily a contra-indication. If ordinary air is introduced the procedure must be repeated about every 3 or 4 weeks. How limited the value of this method of treatment is will be seen by a recent report of Würtzen and Kjer-Petersen (*Dansk. Klinik*, 1910, S. 33). They tried the treatment in 22 cases but were only able to carry it out satisfactorily in seven. In seven other cases only a partial pneumothorax could be got, while in the remaining cases, owing to adhesions, the method proved impossible. Despite this very limited measure of success they still ascribe a certain degree of value to this form of treatment, as one of their seven cases, in which the pneumothorax was successfully carried, was cured, though under any other method of treatment the outlook seemed hopeless.

## TYRAMINE.

This organic base has recently been isolated. It is prepared from tyrosin by the action of certain bacteria normally present in the intestine. Tyramine has an action resembling that of ergot, and has been introduced into practical therapeutic as a vasoconstrictor. A short account of its effect on man is given by Clark (*Biochemical Journ.*, October 1910). Even large doses up to 100 mgrms. by the mouth produce only a slight rise of blood-pressure, but when injected in doses of 20 to 50 mgrms. into the subcutaneous tissue over the clavicle it causes a well-marked rise of blood-pressure, lasting about 30 minutes. The rise varied from 20 per cent. to 50 per cent. of the previous pressure. The heart is slowed. The drug seems worth trying in conditions of shock.

THE EFFECT OF CONTINUOUS ADMINISTRATION OF SMALL  
DOSES OF QUININE.

Graziani (*Archiv. f. Hyg.*, 1910, vol. lxxiii. H. 1) has investigated the possible danger of continuous administration of small quantities of quinine as a prophylactic against malaria. With this object he administered quinine hydrochloride to rabbits and guinea-pigs in doses proportional to that used for man in the prophylaxis of malaria. The drug was administered hypodermically in a weak solution over long

periods of from 70 to 90 to 100 days. Contrasted with control animals receiving only injections of normal saline, he found that the growth of quinised animals was distinctly impaired. This is most evident in the case of young animals. Thus after an experiment extending over 75 days he found that the quite young rabbits which received daily injections of quinine only put on 21 per cent. in weight compared with the increase of 38 per cent. in the controls. In half-grown animals the increase in the quinine series was only 7 per cent. against the 12 per cent. increase in the controls, and in adult rabbits the increase was 2 per cent. against 6 per cent. in the control. Apart from this interference in growth, quinine had apparently little action. No difference could be determined in the hæmoglobin or corpuscular elements of the blood, and the bactericidal action of the serum tested against *B. typhosus* showed no change in the quinine series from that of the controls. If, however, he subsequently immunised against *B. typhosus* the animals previously subjected to the prolonged treatment with quinine he found that their power of producing immune bodies was much less than that of the controls. Further, he found that the previous treatment with quinine rendered the animal much less resistant to infection with anthrax, typhoid, cholera, or pneumonia germs. It appears from this investigation that such prolonged use of quinine is by no means an innocuous proceeding, as it may prevent the growth of young animals, and subsequently lower their power of producing immune bodies and of resisting microbic infections. From a series of similar experiments on man, he believes that the deleterious influence upon the blood-serum probably holds good for man too, and therefore concludes that the indiscriminate prophylactic use of quinine in malarial districts is not without a certain risk.

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## NEW BOOKS AND NEW EDITIONS.

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*Diseases of the Brain and Mental Diseases:* Being Volume VIII. of a "System of Medicine." By Sir CLIFFORD ALLBUTT, K.C.B., and H. D. ROLLESTON, M.A., M.D., etc. Second Edition. Pp. 1049. London: Macmillan & Co. 1910. Price 25s.

ABOUT 800 pages of this volume are devoted to affections of the brain and its membranes, and include those allied to insanity, such as hysteria and neurasthenia. The subject of mental diseases is introduced by Dr. Savage in a lucid exposition, while "Vice, Crime, and Insanity" is an ably-reasoned article by Dr. Mercier, which well repays careful study. An instructive paper on "Idiocy" by Drs. Shuttleworth and Fletcher Beach follows. An exhaustive and suggestive account of the "Toxic Insanities" by Dr. Savage, like his article on "Mania,"



contains many useful facts on treatment. "Acute Delirium," by Dr. Percy Smith, begins with an account of the various views as to the entity of this disease. An excellent description is followed by a particularly useful account of therapeutic measures to be adopted. A paper on "Insanity after Surgical Operation," by Mr. Clinton Dent, rather leads one to the conclusion that it can scarcely be regarded as a clinical variety of mental disease. In the "Epochal Insanities" Dr. Clouston presents a virile case for his adolescent insanity as against the more recent dementia præcox of the Kraepelin School. It must be conceded, moreover, that his views are by far the more intelligible. His description of the insanities occurring at the various physiological crises should be readily recognisable by all who specialise in psychiatry. A scholarly account of "Epilepsy and its Relation to Insanity," by Dr. Robert Jones, is very much up to date. Dr. Henry Rayner's paper on "Melancholia and Hypochondriasis" is full of interesting and instructive reading. The article of the late Dr. Conolly Norman on "Systematised Delusional Insanity" (Paranoia) is so comprehensive as to be almost a dictionary of all the various perverted intellectual states.

Merely to mention a few of the names of the contributors is sufficient to show that this volume is from the pens of men of exceptionally wide experience and learning. It should be read by all alienists, and as a book of reference should prove most valuable in the library of the general practitioner.

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*Practical Motherhood.* By HELEN V. CAMPBELL, L.R.C.P.&S.(Edin.), L.F.P.&S.(Glas.). Pp. xx., 535. With Illustrations. London: Longmans, Green & Co. 1910. Price 7s. 6d.

THE writer describes her work as a "little book," but it is a fair-sized volume of over 500 pages of rather small print. It is really a popular work on midwifery and diseases of childhood, but the "motherhood" is extended to include the management of children at school, and it is in the later chapters that there is much to commend and not a little that is somewhat out of the beaten track of books such as this. The authoress quotes from a French writer regarding the after-period of school life: "As the time goes on the material bond between mother and child is bound to grow slacker and slacker. Suckling itself is a secondary act, providing spoon meat is very different from suckling, and so the tie is continually loosened till the day when the child can do without her. But in proportion as the physical bond slackens the moral bond ought to grow firmer and firmer. The day that her son is known for a brave, a brilliant, an honourable man, will she not feel more than ever his mother, with a deeper, an intenser, feeling than

when she nursed him at the breast?" The chapter on sex-training is plainly and yet clearly written, and is to be commended to parents and guardians; indeed the whole work is helpful and full of homely wisdom.

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*Prophylaxis of Malaria in India.* By Lieut.-Colonel P. HEHIR, I.M.S.  
Pp. 307. Allahabad: Pioneer Press. 1910.

THE work is divided into three parts, preceded by a short but interesting chapter on the History of Malarial Investigations.

In the first part, after considering in a concise manner the importance of antimalarial campaigns, valuable statistics are given concerning the prevalence of malaria in India among European and native troops, and the jail population. Under the heading of "Contributory Causes of Malaria" the author deals in a broad-minded manner with the proved and theoretical causes of the disease, and concludes with an exhaustive description of the Indian mosquitoes and their habits, and of the different forms of the malarial parasite. It is to be regretted that the author has been unable to furnish in this section illustrations even of the most elementary kind to elaborate his descriptions.

The second part deals with the "Effects of Malaria on Man." This is the most unsatisfactory portion of the book, for on reading some of the sections one is forced to the conclusion that on certain subjects the author is not quoting from personal experience, or fails to express himself lucidly. This is especially noticeable in the references to *kāla-azār*, from which the conclusion might justifiably be formed that the parasites are always intracellular, and can only be found in the peripheral blood after centrifugalisation.

The third part, "Methods of Prophylaxis of Malaria in India," is undoubtedly the most valuable. The chapter on Quinine in Malaria is excellent. The present fashionable method of administering quinine by intra-muscular injection on occasions when it is absolutely unnecessary is treated in the manner it deserves.

The chapters on Prophylaxis are evidently the outcome of extensive experience, and dealing as they do with prevention among troops, in villages, houses, schools, and the general community, may be read with profit by all concerned with malarious districts, whether in India or elsewhere.

The absence of any kind of illustration is a distinct drawback. We can appreciate the difficulties in the production of a work of this kind in India, and it is to be regretted that the author, having so much valuable information to impart, did not arrange for the book being illustrated, or at least published, in this country, when the necessity for the long list of errata on the first page, which, by the way, does not by any means include all the errors, might have been obviated.

*Tropical Medicine and Hygiene.* In Three Parts. Part II. Diseases Due to the Metazoa. By C. W. DANIELS, M.B.(Cantab.). With a Chapter on Snakes by Lieut.-Colonel A. ALCOCK, I.M.S. Pp. 283. With Coloured and other Illustrations. London: John Bale, Sons & Danielsson. 1910.

THIS volume, the second of three the author intends to publish describing the diseases due to various kinds of parasites, is devoted to the consideration of the diseases due to the metazoa, including the platyhelminths, nematohelminths, and arthropoda. The chapter on Snakes by Alcock is excellent and undoubtedly one of the best parts of the book; the illustrations are numerous, and the manner in which they are reproduced reflects great credit on the publishers.

It is stated in the introduction that "this part deals at length with the better known parasitic metazoa only, and with the diseases they cause; other branches of the subject are dealt with in less detail." Perusal of the book shows that this idea has been more than carried out, with the result that while many rare and inoffensive worms are illustrated and described in great detail, some members of the arthropoda, for example scorpions, which are active agents in the causation of disease in the tropics, receive very scant attention or are left unnoticed.

In addition to the faults of omission some inaccuracies are to be noted; for instance, the statement that "the eggs of schistosomum hæmatobium differ from those of the other trematodes in that there is no operculum" is hardly in accordance with the views of other observers, while those who are dealing almost every day with bilharzial urine will be unable to agree with the assertion that "the miracidium is only let free when the urine is freely diluted."

One cannot help feeling dissatisfied with the book. Owing to its limitations it cannot be regarded as a work of reference or accepted as a worthy outcome of the author's ripe experience.

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*Outlines of Zoology.* By J. ARTHUR THOMSON, M.A., Regius Professor of Natural History in the University of Aberdeen. Fifth Edition, revised, with Illustrations. Pp. xxii. and 855. Edinburgh, Glasgow and London: Henry Frowde and Hodder & Stoughton. 1910. Price 12s. 6d. net.

WHEN a text-book on zoology has in a few years reached its fifth edition it is pretty well beyond criticism. Year by year Professor Thomson has endeavoured to keep his text-book up to date by including in it whatever is new and important in zoology.

In the chapter on Protozoa, for example, there is a brief section on "Protozoa and Disease." The student of medicine who comes to

study this subject more fully as a part of pathology will be helped to some extent by the short introduction to it he has already received in his zoology. If, however, Professor Thomson's text-book is to retain the proud position which it has already aquired, this part of the subject must be extended, so that when the student resumes it in pathology there may not be much to add to what he has already learned of its general history, and he may be able to give his all but undivided attention to microscopical investigation.

Though the majority of students using the book are students of medicine, yet those wishing to specialise on any subject of zoology will find here an excellent introduction to such specialisation. Indeed, until curriculum pressure restricts the sphere of writers on zoology in our medical schools to such parts of the subject as have a direct bearing on the practice of medicine, the student can find no better text-book than Professor Thomson's.

All praise is due to the author for the judicious strengthening which is noticeable throughout this edition, especially in the introduction of diagrams and illustrations from recent works. Indeed some subjects are dealt with in such detail, both as to explanation and illustration, as to render a book on practical zoology on these subjects unnecessary.

His short paragraphs—all too short!—on Pedigree, Relationship and History, are most interesting and instructive, and all through the book is written in a style lucid and vigorous. His chapters remind us of the lectures of Ernst Haeckel, with an added grace and charm all the author's own. No other book known to us contains so much in the same space and at such a reasonable price.

It is undoubtedly the best text-book on the outlines of zoology.

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# EDINBURGH MEDICAL JOURNAL.

## EDITORIAL NOTES AND NEWS.

### Open-Air Schools.

ALTHOUGH the project which has recently been before the Edinburgh School Board for instituting an open-air school at the Victoria Hospital has in the meantime been set aside, the discussion which it aroused has not been fruitless, for it has served to bring into view some of the difficulties which require to be faced in planning an open-air school. The difficulties are not insuperable, and it would be a misfortune if so desirable an object were indefinitely delayed because a particular scheme may happen to prove unworkable. It is unfortunate that at the outset an element of confusion has crept in by the use of the word "phthisis." As we understand the matter, the promoters' plan was to provide for the education of children suffering from tuberculous disease, and, in particular, from tuberculosis of the lungs, whereas it has constantly been spoken of as a school for children with phthisis. This misnomer has tended to give a false idea of the infectivity of these children. One has heard the argument—"The children are tuberculous: they cannot be allowed to go to ordinary schools; they must be educated; what better place than near a consumptive hospital."

A properly conceived scheme for an open-air school must keep two objects (additional to its primary one of education) steadily in view. First, it is a curative, second, a preventive, agency. It aims at curing its own scholars, whether of actual disease or merely of constitutional delicacy; it aims at preventing disease by removing infective, or potentially infective, children from the crowded class-rooms of city schools. Viewed in this way, children who might beneficially attend an open-air school fall into several groups. First, convalescents from illness, cases of debility—speaking broadly, delicate children. Second, children suffering from chronic non-tuberculous complaints, especially of the lungs. Third, children suffering from chronic tuberculosis of a non-infectious type. Fourth, cases of infectious tuberculosis. In the first three groups the question of infection does not arise. Theoretically, no doubt, a child with abdominal tuberculosis might transmit the infection; practically, the risk does not exist. There is no medical objection to the co-education in an outdoor school of children suffering

from the numerous tuberculous and non-tuberculous affections which are comprehended in these three groups, and such children would include by far the largest number of those unsuited to participate in ordinary school life, yet physically capable of benefiting by an appropriate education.

As to the fourth class—the infectious tuberculous children—these would certainly form a small group. It would consist of children proved to be suffering from pulmonary tuberculosis by the presence of bacilli in the sputum. It would be small for two reasons: first, because pulmonary tuberculosis in this sense is not common among children of school age; and, second, because many, probably the majority, of such cases are not in good enough health to receive any education at all. On these grounds, therefore, it would seem that to institute a school for such children in connection with a hospital for consumption is to begin at the wrong end—to provide for a small minority and neglect a large majority among the suitable cases. There remain, however, to be stated certain facts which make the above classification of cases a little less simple in practice than appears on paper.

The crux of the whole matter is the difference of opinion which exists as to what constitutes pulmonary tuberculosis in children—a question, therefore, of clinical diagnosis. Children are liable to forms of chronic bronchitis and broncho-pneumonia which, so far as physical signs go, simulate tuberculosis, but which resolve completely and speedily under favourable hygienic conditions. There is little cough and usually no expectoration; the sputum, obtainable with difficulty, does not show bacilli by ordinary methods, although a proportion of the cases give a positive cutaneous reaction to tuberculin. Those who assert that pulmonary tuberculosis is common in children include such cases; those who are of the contrary opinion exclude them. They exclude them because of their benign course in comparison to demonstrable pulmonary tuberculosis (which is a more serious disease in children than in adults), because of the absence of bacilli from the sputum, and because a positive Pirquet reaction has no value in localising the site of a tuberculous process.

In the face of this diagnostic difficulty, and until the difference of opinion is reconciled, surely, from the point of view of school hygiene, the test of infectivity is the one which should be applied. Children whose sputum contains bacilli ought to be segregated for the sake of others, to be treated medically for their own. It is questionable whether in most cases medical treatment ought not to involve lying fallow as far as education is concerned, but if suitable patients exist in sufficient numbers to justify a special school, the experiment might well be tried. A more pressing problem, however, is to provide one or more open-air schools, under medical supervision, for non-infective

children; their scope would be wider and their benefits greater than if restricted to the tuberculous alone. Finally, it would be well to bear in mind that though education must needs be the primary object of a school, instruction must be subordinate to questions of health. There is a risk that these schools may prove disappointments through too much being expected of them. A weakly child needs rest more than education, and play more than lessons; if his schooling keeps him from losing what he has gained he will soon enough, when health is restored, make up the time that has been lost.

The late Dr. Andrew  
Smart.

THE death of Dr. Andrew Smart recalls my association with him in our student days in Edinburgh. He had studied in the Glasgow Arts Faculty before he began his medical career, and being older than most of his contemporaries he appeared to have few intimate friends. The Royal Medical Society was the arena in which we often met, and later, when Smart was resident in the Infirmary under Bennett and Laycock, we were more thrown together. I was his successor in the clinical wards. We all appreciated his knowledge and general literary training, and, no less, his unvarying even temper and suavity. Smart was, however, a very sensitive man, and probably felt more than he expressed. He had high ideals, and set himself to original investigation during his residence in the Infirmary. The subject of diabetes had a great attraction for him, and he did some of his best work in connection with rinderpest, his researches being pushed as far as was practicable in the days of præbacteriology. His papers were all of interest and the results of original observation. Others can, better than I, tell of his later years when he was a clinical teacher, and of his influence in the medical school. He was one of those able men who, though modest, are ambitious, and yet resent inadequate appreciation of their work. He had peculiarities and mannerisms, was sympathetic and kind-hearted, but was little adapted to face the inevitable struggle which leads to the due recognition of merit. He had his sorrows and trials, but they were mitigated by kindly sympathy of his old friends and the devotion of an attached wife. Those of us who knew him best can have none but kindly memories of him, and a deep respect for his high character and uprightness. His memory will long remain green in the minds of his old fellow-students scattered in many parts of the world. *Requiescat in pace.*

DYCE DUCKWORTH.

The late Dr. George  
Henderson.

THE death of a brilliant youth at the outset of a career of uncommon promise is a loss to the world as well as a grief to his friends. In no walk of life does such a sorrow oftener take place than in our own ranks—no

doubt in consequence of the greater risks to which our members are exposed as compared with those of other professions. Once more a bright young life has been quenched. Dr. George Henderson, eldest son of Dr. Henderson of Coldstream, died on Friday, 17th March, after thirty-eight hours of virulent pneumonia. He had a distinguished record at the University of Edinburgh, and took his Bachelor's Degree in 1907 with first-class honours. He was House-Physician to the Royal Infirmary, House-Surgeon to the Maternity Hospital, and House-Surgeon to the Scarborough Hospital; after which he joined his father in practice at Coldstream. Young though he was, he made some really original observations, one of which was published in association with Dr. W. T. Ritchie.

His nature showed a rare combination of strength and sweetness. This rendered him, whether in the medical, athletic, or social world, a man greatly beloved, and caused him, quite unconsciously, to exert a wonderful influence for good over his contemporaries. His death has produced a sense of desolation, not only throughout Tweeddale but wherever he was known, and to all of us who loved him the loss is irreparable.

"From the contagion of the world's slow stain  
He is secure, and now can never mourn  
A heart grown cold, a head grown grey in vain;  
Nor, when the spirit's self has ceased to burn,  
With sparkless ashes load an unlamented urn."

Such is the only consolation found by one poet in the early death of another. To us in the domain of practical science there is not even solace in such thoughts when we know how much our lost friend could have done for the world.

G. A. G.

Professors and  
Examinations.

It used to be regarded in this country almost as an axiom that every student should be examined for his degree by his own professor.

Lately, we have come across some who are beginning to doubt the wisdom of this plan and point to Oxford as an example of the success of another method.

Now we have Professor Lannelongue of Paris roundly denouncing the custom and condemning it utterly. His views were published as an interview in the *Temps*, and we take the report from the *Gazette des Hôpitaux* of 25th February.

"Several considerations led me to propose this reform to my colleagues on the Commission on Higher Education.

"On the one hand medical education is overcrowded. It must be given more freedom, enlarged, and allowed to give scope for initiative.

"Then it is important to relieve the professor of the burden of



examinations. It is a tiring task and takes the medical teacher from his true duty of giving others the benefit of his learning, of advanced teaching, or of contributing by his writings and experience to the advancement and development of science.

"Again, if the examiner were an independent specialist who did not know the candidates, and was therefore without prejudice, the examination would necessarily be more open, freer, and, I may even say, fairer, while the professor, now a professor only, would be less hindered in his teaching. For the student there would be great advantages. He would neither have to follow the opinions of an examiner who is also his professor, nor be in the awkward position of coming up for examination before two professors whom he knew to hold different views on a question.

"Finally, there is every reason to believe that this reform would be welcomed by doctors as a whole.

"The question arises whether sufficient material can be found outside the teaching staffs to form a body of examiners. In the large University centres there will be no difficulty. Paris, Lyons, Bordeaux, Nancy, Montpellier and others have plenty of medical men eminently fitted to act as examiners. In towns where examiners who are not also teachers cannot be found, the present system will have to be retained. The *agrégés libres* whose position is so interesting and is at present giving rise to so much controversy, might as examiners find scope for their energies.

"I am perfectly convinced that both from the moral and social point of view, ideas like those which suggested my proposal ought to be spread and applied.

"The President of the Senatorial Commission on Higher Education, M. Charles Dupuy, after hearing my views, asked me if I did not think I ought to propose to extend the reform to all kinds of University education. I refused, not thinking I had sufficient knowledge of conditions outside medical teaching. But I am quite convinced that in all kinds of teaching it would be a great boon if the student's attainments were never again judged by his own professor."

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**Medicine and the State.** ALL thinking medical men are at present much exercised over the attitude which the profession should adopt towards the proposals for State insurance against sickness and invalidity. The weekly journals teem with correspondence and reports of meetings held to consider the—we can only say—general question, for the Government proposals are not yet before us. The medical profession is essentially conservative and constitutionally opposed to change, but it seems to us that it would be very unwise to adopt the attitude of simple opposition. Whatever Government is in power this insurance is going to come, and it would

better become our profession to help than to hinder in the matter. We must not have it said that we are the reincarnation of the silversmiths of Ephesus, for we are not, and the appearance of something of that spirit is only the result of apprehension of the unknown. And it is necessarily unknown, for the Government has not only not got any definite plan, but has not even decided whether medical attendance shall be included in the scheme.

Everything is in the air as yet, but there is a good deal in the air. Briefly, there are four schemes—(1) An organisation by the medical profession. (2) A National Service Scheme—organisation by the Government. (3) An organisation through the Friendly Societies. (4) No organisation at all. Number 4 may, we think, at once be dismissed. A scheme of Sickness Insurance without medical attendance is on the face of it doomed to insolvency. The Friendly Societies have no doubt done a great work in their day, but we hardly think the medical profession will care to have its affairs arranged by them. In connection with the two remaining schemes we would offer the suggestion whether it would not be wise to trade the promise of our co-operation with the Government for an adequate representation on the National Organisation Board. A British Medical Association Scheme—for that is really the alternative—would necessarily be brought into such close touch with the Government for purposes of practical working that the difference would be more in name than in reality. We believe the interests of the medical profession, which, after all, are the same as those of the general community, would be quite adequately safe-guarded by their representation on a Joint Board along with representatives of the contributors to the scheme, the ratepayers, and the Public Health Authority.

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The International  
Congress.

WE are requested to publish the following  
announcement:—

The Seventeenth International Congress of Medicine will meet in London in the summer of 1913. The exact date is to be fixed by the International Permanent Committee, which will assemble for the first time in London, 21st and 22nd April next, under the presidency of Dr. F. W. Pavy.

At the same meeting the list of Sections of the Congress will be constituted. Any wishes or propositions concerning the arrangement of this list may be sent, up to the 1st of April, to the Hon. General Secretary of the Permanent Committee, Prof. H. Burger, Vondelstraat 1, Amsterdam, or to the Bureau of the Committee, Hugo de Grootstraat 10, The Hague.

The Committee will be glad to receive, before the same date and at the same addresses, possible information and propositions concerning the organisation of the Congress.

## ON THE TREATMENT OF LUPUS CARCINOMA.<sup>1</sup>

By NORMAN WALKER, M.D., F.R.C.P.,  
Lecturer on Dermatology, University of Edinburgh.

IN July 1904 I published in *The Scottish Medical and Surgical Journal* a lecture which I had delivered to my students under the heading of "Lupus, Carcinoma, and X-Rays." For my text I took four cases of lupus carcinoma which I had at that time under my care, in three of which X-rays had been used for treatment. It is now generally recognised that carcinoma is a not infrequent sequel of X-ray treatment, and cases have been recorded in all parts of the world.

In that lecture I referred to excision by the knife as the best treatment, and I laid stress upon the importance of early recognition of the complication. Since then further cases have come under my notice, and I have seen reason to alter the opinion then expressed as to treatment.

The following are brief histories of some of the cases which have been under my care: they include those recorded in 1904:—

James S., aged 32. First seen in 1904. Had had lupus for thirty years. It developed in the scar of tuberculous glands and spread slowly and steadily. He was several times scraped for lupus, but never had any X-ray treatment. (His condition on admission is shown in Fig. 1.) Under ten weeks of treatment by the X-rays there was marked improvement (as shown in Fig. 2), but the disease again commenced to spread in spite of the ray treatment, and he was transferred to Professor Annandale's Surgical Clinique. Professor Annandale operated upon him again and again for recurrences, but these got beyond operation, and the patient died three years ago.

James B. A very extensive case of lupus of the face and neck. He first came under my care in 1900, and for three years, either in Edinburgh or in Glasgow, he underwent extensive X-ray treatment. The results on the lupus were very good, but in October 1903 he first noticed a slight warty growth on his cheek, which in May 1904 was of the extent shown in Fig. 3. This was removed by a surgeon, but the disease returned, and the patient died a few months afterwards.

Christina M., aged 46. Lupus began at the age of ten. When she was twenty she was treated by scarification with considerable benefit. She lived in a very out-of-the-way part of Scotland, miles

<sup>1</sup> Communicated to the Edinburgh Medico-Chirurgical Society, 1910.

from any doctor, and for over twenty years she went without any treatment. She came to the Infirmary in October 1902 with lupus affecting the whole of her face. She had six months of X-ray treatment and later two months more. In April 1904 she noticed a little scab on the side of the nose. This grew very rapidly until it reached the stage shown in Fig. 4, when she came back to the Infirmary. She was admitted to Mr. MacGillivray's ward and he removed the growth, but it recurred and the patient succumbed.

Mrs. H. First came to the Infirmary in May 1902. The face was extensively affected with lupus and the cartilages of the nose were destroyed. From May to November she was treated by the X-rays, again from April to May 1903 and from July to September 1904. The lupus was greatly benefited. The rest of the case is I think best described in a letter received from her husband recently :—

"Dear Sir,—I am writing you because in the interests of your profession you may be interested to know the history of the case of my wife who was for some time under your treatment for lupus in the Royal Infirmary. She was admitted there in 1902 with lupus covering nearly the whole of the face. By your directions she had the X-ray treatment, which was continued from March to December 1902 and from April to September 1903. After this an installation was introduced into the . . . Infirmary, and being nearer home she went there in 1904 and had the X-rays applied two or three times weekly. The face was fairly healed by the Edinburgh treatment, but you advised her to continue it at . . . for some time longer; besides, the disease was active inside the throat. The exposures at . . . consisted of five minutes on each side of the face, and five minutes with the mouth wide open to reach the throat. This went on about twice a week during the summer of 1904. After this there was no trouble with the face. In the autumn of 1907 a small pimple appeared on the cheek, burst and discharged matter and refused to heal. The local doctor tried all kind of remedies, but it continued to enlarge, with a thick roll around the edges of the sore, until it was an inch in diameter. The X-ray treatment was resumed and she had several further exposures; until, in October 1908, the doctor declined to use the treatment any longer, as it was doing more harm than good, and then, for the first time, the word 'Cancer' was used. It continued to spread until the whole cheek from the ear round by the eye, the centre of the nose, and the corner of the mouth was one open sore, discharging offensive matter, and where the ulcer first began it had eaten through the cheek. She died from exhaustion on 18th February 1909."

David W. First came under my care many years ago when he was a lad. He then had a broken-down, discharging tuberculous gland,





FIG. 1.



FIG. 2.





FIG. 3.



FIG. 4.





which had infected the skin—a scrofuloderma. As there were other infected glands I recommended that they should all be treated surgically by excision. I saw no more of him for years. My advice had not been taken. Ointments had been applied locally and medicines taken internally. The skin was now affected with lupus from ear to ear, right round under the jaw and spreading on to the cheeks. I treated him at intervals with X-rays for over two years with considerable benefit. About six years ago he came back, after a considerable interval, with a large typical lupus cancer as large as a Tangerine orange upon the right cheek. He had no suspicion of the seriousness of the condition, and was with some difficulty persuaded to enter a surgical home, where the growth was removed by my colleague, Mr. Wallace. Examination proved it to be a typical epithelioma. The wound made through the scar tissue was very slow in healing, but it ultimately granulated up, and remained sound for a few weeks, when the growth reappeared. He did not seek advice for some months, and when I saw him next the growth, which was of precisely the same character as before, had a diameter of about eight centimetres.

The results of excision, of which I had now had some experience, were so unsatisfactory that I resolved to try other methods. I took him into a home, and under an anæsthetic scraped away all the disease. When hæmorrhage had ceased I scrubbed the raw surface over with solid caustic potash. As was to be expected there was considerable after-pain, but he has always been very plucky and stood it well. Within ten days there was evidence of a recurrence of the growth, and in three weeks it was nearly as bad as ever. I again put him under chloroform, scraped thoroughly and applied fused chromic acid to the raw surface. When the scab separated (in about three weeks) the scar appeared sound, but in three months one corner of it broke down. This was again treated by scraping and the application of arsenious acid—that most painful of all caustics. He bore it, however, with great fortitude and went home apparently well, and at last impressed with the seriousness of his condition. He returned in two months with a very tiny warty growth at one edge. This I froze with chloride of ethyl and scrubbed with fused chromic acid, and I am glad to say that now, two years later, he remains well.

Maggie M., aged 29. Consulted me in August 1907. She had suffered from tuberculosis of the glands and skin for over ten years, and her right arm was extensively affected. In 1902 she commenced treatment with the London Hospital Lamp, and this was continued for two years. In 1904 X-ray treatment was begun and continued for two years. She is an intelligent girl, made herself useful in the department, and often administered the treatment to herself. During this time an X-ray reaction was produced and a small ulcer developed. The X-rays

were stopped in September 1906. In January 1907 she had an injection of tuberculin which produced a smart local reaction. In April the ulcer was spreading both in extent and depth and giving rise to pain. When I first saw it it was of the extent shown in the cast (Fig. 5) and both its history and its appearance suggested malignancy. I removed a small piece and had it examined by Dr. W. Ritchie, who reported it to be a typical epithelioma.

The girl came to me in consequence of the very bad prognosis given by the surgeon whom she had consulted elsewhere, and fear for the treatment which he recommended, viz. amputation. I must say I was inclined to agree that that was the proper treatment, but at the earnest petition of the girl and her mother, and having impressed on them the risks which they were running, I decided to try the effect of arsenious acid. This was applied in September 1907, with the usual painful and destructive effect. When the slough separated, healing went on steadily, and by 7th November it was looking so healthy that I allowed her to go home. On 21st December it had almost healed, and only two tiny points looked suspicious. In January these had completely healed, and in my notes it is stated that she has the use of her hand. On 9th May there was a return of malignant ulceration and an area of the size of a threepenny piece was scraped and chromic acid was applied. Since then there has been no recurrence, and, except for two occasions when from irritation of the lupus there has been lymphatic blocking and swelling, she has been able to use her arm fairly satisfactorily.

J. B. First seen in 1902, when the lupus had lasted for twelve years. He had prolonged X-ray treatment with great benefit to the lupus. On 1st March 1904 a small warty growth was noticed on the right cheek; this was removed by Professor Annandale and did not recur. Treatment by X-rays continued until October 1904. He visited the hospital in March 1907, when it is noted that "the lupus is very well and there has been no recurrence of epithelioma." In June 1908 he returned with a large epithelioma on the left side (see Fig. 6), which he said had been growing for six months. Fig. 7 shows his condition in March 1910.

Janet J., aged 30. First consulted me on 15th January 1908. She had lupus since childhood. X-ray treatment was begun in 1902 and continued for four years. After a year's rest some further treatment was applied for a few months. Four or five months ago a lesion appeared upon her cheek, which, when I saw it, was about three centimetres in diameter, and showed the characteristics which one now associates with X-ray lupus carcinoma—with the hard, rolled edge so well described by the husband of one of the patients. I operated on 25th January in the method afterwards described. On 14th September



FIG. 5.







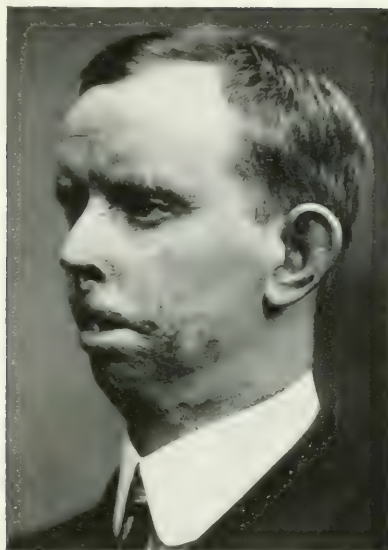


FIG. 7.



FIG. 8.



1908 a small lesion developed on the right malar eminence, which was similarly treated. To-day, June 1910, she is quite well.

Francis F., aged 50. Came to hospital on 30th October 1909. He has extensive lupus on the right side of the face and neck, of a quiescent type. He saw Dr. Allan Jamieson twenty-six years ago and has had no treatment since then and therefore never had any X-rays. Eight weeks ago he noticed on his right cheek, in the centre of the lupus scar, a small warty growth. This rapidly increased, and on admission was as large as a small walnut. On 1st November I treated the growth by erosion and chromic acid. In April I wrote asking him to come and see me again, but he replied that there was no need as he was quite well.

My friend Professor Wild of Manchester has very kindly permitted me to refer to a series of cases which he published in the *Medical Chronicle* of November 1907, and he has placed at my disposal the blocks of his illustrations, one or two of which I have made use of to point the remarkable similarity of the lesions of this disease. I append brief abstracts of his nine cases, and it will be noted that every one of them terminated fatally whether the treatment was by excision or by X-rays.

#### WILD'S CASES.

1. Female, æt. 68. Lupus from childhood. Had no X-rays. No glands, no secondary growths. Duration of epithelioma, sixteen months. First seen 8th August 1893. Died 19th December 1893. Post-mortem.

2. Male, æt. 44. Lupus from childhood. Had no X-rays. First seen 5th November 1896. Typical X-ray cancer. Duration eighteen months. No enlarged glands. Died 9th July 1897. (Fig. 8.)

3. Male, æt. 37. Lupus of old standing, operated upon in 1895. Duration about three years. Post-mortem. No glands. Died 1898.

4. Female, æt. 42. Lupus since childhood. First operation in 1897. Section showed suspicious growth. Second operation in 1900, wide removal, no recurrence. Admitted for another growth in 1901. X-rays did good. Another growth appeared in 1903. X-rays spread rapidly. Died in 1904. No glands or secondary growths.

5. Female, æt. 46. Had had no X-rays. Growth scraped and thermocautery applied in 1900. In 1901 a fresh growth was found. X-rays did good. In 1902 X-rays did good to lupus. In December 1902 another growth appeared. X-rays were applied but did no good. Died July 1903. No glands.

6. Male, æt. 48. Lupus since childhood. Had a warty growth in front of ear excised several years ago—recurrence, a second operation—recurrence, a third operation six months ago. In February 1904 he

was admitted to hospital and the mass of growth removed. X-rays applied to base. On 6th March growth had gone and ulceration was healthy. On 22nd April recurrence was evident. Death in autumn. No mention of glandular involvement. (Fig. 9.)

7. Male, æt. 18. Lupus began at age of 3. X-ray treatment in December 1901, continued irregularly during 1902 and 1903. In December 1903 a slight burn resulted. In May 1904 the scar seemed healthy. On 25th June 1904 patient came with what appeared to be a small carbuncle below the seat of the X-ray burn. On 27th July the carbuncle was papillomatous and on 24th October evidently epitheliomatous. Operation was refused and patient died in July 1905. No secondary lesions were found in the glands while under observation. No post-mortem. (Fig. 10.)

8. Male, æt. 65. Lupus for twenty years. Had had no X-rays. Ulcer half-inch diameter, of two months' duration. Operation was refused. X-rays applied 24th February 1904. On 16th November 1904 patient was discharged healed. On 28th June 1905 recurrence of ulcer. X-rays applied again. Patient was very irregular in his attendance. Reported dead. No glands observed during life.

9. Male, æt. 38. Lupus since childhood. Had had no X-rays. First seen 3rd March 1906. Large ulcer four inches in diameter, began "like a boil." Treated for four months with X-rays. Effect was at first good, but useless later. Stopped finally 17th April 1907. Died in January 1908. No secondary lesions in glands.

Dr. Wild concludes his paper as follows:—"Finally, I wish to emphasise the importance of warning all middle-aged patients with lupus scars of the necessity of at once applying for treatment should the scar show any tendency to a warty formation or ulceration. Superficial lesions of this character may be treated by X-rays as in several of the above cases, but usually recur, and the same may be said of surgical removal. I believe, however, that an immediate and complete excision—even though the operation has to be carried out through scar tissue—offers the best chance of cure, and in any case prolongs the life of the patient and affords a period more or less prolonged before the growth recurs or a fresh lesion appears."

It is because I desire to urge on the profession the merits of the apparently crude method of treatment by erosion that I have written this paper. As I said at the commencement, I was formerly an advocate of the knife, but the terrible mortality led me to ponder the question whether nothing else could be done. In the specimens which were removed one noticed how superficial the growth was, how dense was the layer of fibrous





FIG. 9.





tissue beneath it, and how in all my cases the disease was local and did not spread to the glands.

In operating I scrape vigorously and remove everything which the spoon will bring away. I take special pains to arrest the hæmorrhage, even to the length of applying adrenalin, for I think it is important that the caustic should reach as deeply as possible and not be obstructed by blood.

In extensive cases an anæsthetic is necessary, but now that we are familiar with this complication one should be on the outlook for it at a stage when it can be treated without this necessity. In more than one subsequent case I have recognised the earliest signs of the growth at a stage when it could be easily destroyed under local anæsthesia: indeed my usual plan in these cases now is to freeze the part with chloride of ethyl and finish the whole operation before the effects have passed off.

I have unfortunately not got illustrations of all my cases, but those I have show the important points. The very similar cases of James B. and J. B. show a very striking contrast in the result; the one died not many months after the first operation, the other is alive to-day, and, as the second photograph of the case shows, well.

Quite recently I have treated such early lesions as have come under my notice by applications of CO<sub>2</sub> snow, and have every reason to be satisfied with the result. Perhaps in this connection I may refer to a case of xeroderma pigmentosum at present in my ward, where the improvement under this method has been quite remarkable. There is something in those types of skin cancer separating them from the ordinary epithelioma and allying them more to the rodent ulcer. It is quite exceptional for them to spread to the glands, and one is therefore justified in using measures which are unjustifiable when every day means a further risk of metastasis.

I learned from Dr. Allan Jamieson the merits of chromic acid. I think if it is not possible to scrape the diseased surface thoroughly that arsenious acid is preferable; it is intensely painful, and the pain gets worse and worse as time goes on, becoming so bad that the patient's complaints are a serious temptation to one to arrest the treatment too soon. Chromic acid is intensely painful when applied, but the pain is soon over and there is formed a thick scab under which the healing process goes on most satisfactorily. In superficial rodent ulcers it is a most efficient method of treatment, and the scars left by this operation are as good as any reasonable person can expect after such serious maladies.

## THE MEDICAL EXAMINATION OF EMPLOYEES.

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THE practice of making a medical inspection of individuals with a view to the early detection of actual disease or a liability thereto is becoming more widespread within recent years. Medical inspection of school children in this country has now been established by Act of Parliament, and, of course, for many years applicants for the various branches of the Civil Service have had to satisfy a medical examiner before being accepted as servants of the State. The need for a much wider inspection of workmen in all kinds of employment has been borne in upon employers in view of the recent Workmen's Compensation Acts, and more especially of the wide interpretations which have been given in various courts to the term "accident." Now if this need is being felt in the case of workmen employed upon land, it is not to be wondered at that shipowners have found it still more urgently necessary for their employees, there being several reasons why medical inspection is especially necessary in the case of seagoing persons.

1. The essentially hazardous nature of much of the work calls for only men in good condition being engaged.

2. The shipowner is liable for accidents to his employees, not only when at their work, but when they are asleep, theirs being, so to speak, a whole-time employment. Thus, a seaman injured when in his bunk (*e.g.* by a collision) falls to be compensated though he was not "employed" at all, in the ordinary sense, at the time of the accident.

3. Owing to the entire absence, in the great majority of seagoing vessels, of any qualified medical aid, a comparatively slight injury may have serious or even fatal results; even if a correct diagnosis be made the treatment may be wrong, as is so often seen in cases of wounds and fractures. An attempt has been made for some years now to improve this state of matters, so far as Leith is concerned, by giving instruction to officers in ship medicine and surgery, but the contrast between the case of an injured man *at sea*, lying in a dark fo'c'sle, with neither doctor nor nurse of any kind, and the lot of the injured *shore-worker*, removed at once to hospital, with skilled attendance and every appliance and facility provided, is not, I think, sufficiently appreciated.



4. But there is an even stronger reason for medical inspection of crews, for, under a recent Merchant Shipping Act, the owners are liable for the expense of treatment of *illness* arising in any member of the crew, and if the patient has to be left ashore for treatment they are liable for his expenses till he is landed again in the United Kingdom. The detection, therefore, before the man joins his ship, of any probable causes of disability, is of considerable importance, and all the more when it is remembered that no substitutes can be got at sea for the men laid off by illness or accident. The vessel has to be worked by those who are fit, so that if the others are not to be overworked it is also to the interest of the men themselves (though they cannot always be got to see this) that only healthy men should be allowed to join.

It is with the medical inspection, then, of seafaring employees mainly that this paper will deal, and it may be of interest to relate how the system of inspection was established. In the spring of 1907 the Shipping Federation, which is an association of many of the largest shipowners of Britain, summoned to their London offices a conference of doctors (of whom I was one) from the various large seaports in this country and the Continent. Our duty was to draw up a uniform system of medical examination for all ports, a method of recording the results, and a schedule of the various diseases or surgical affections to be reported upon. In regard to this latter I held strongly that there is not the same need for such a high standard of physical fitness in certain respects (*e.g.* hernia, varicose veins) in the case of men taking short voyages (which constitute a fairly large proportion of the sailings from Leith) as with long trips of weeks' or months' duration, such as the inspecting doctors from ports like Cardiff or Liverpool have more to do with. Thus, in my opinion, a man may be passed for voyages from Leith to Hull, but not from Leith to Honolulu. Difficulties arising from, *e.g.*, a truss breaking, have not quite the same risk attached in the case of a man who can be in port in twenty-four hours. Books were prepared by the Federation Office containing on each sheet a list in columns of the various disabilities which might be discovered by the medical inspector, who then puts a cross in the particular column opposite the name of the employee, carbon duplicate sheets being used.

Medical men were appointed by the Shipping Federation at each seaport—there are two at Leith—whose duties are, (1) to carry out this medical inspection of crews before they "sign on," and (2) to examine employees who allege they have sustained

injuries at their work. As this latter duty includes reporting upon many *shore* workers, *i.e.* those engaged in handling the ship's cargo, who are *not* medically inspected before engagement, I shall confine my remarks at present to the former, *viz.* the medical inspection of ships' crews. At the outset I wish to emphasise particularly that it is only an *inspection* or survey that is made of the men, and *not* a medical *examination* of a patient in the ordinary sense. It is thus perfectly different from the medical examination of entrants for the Post Office, Customs, &c.; no family history or the like is asked—it would not be easily obtained even if asked from a crew of aliens—nor is the urine examined. The main points to which attention is directed are—(1) Eyesight; (2) Hernia; (3) Venereal Diseases; (4) Varicose Veins; (5) Ulcers or Previous Injuries; (6) Heart and Vessels; (7) Giddiness and Fits. I should explain that in the case of trading boats with short trips the crew “sign on” for six months, and are then examined; for long voyages they “sign on” for each trip. In carrying out the inspection the man is asked to let go his trousers, &c., to his feet, and hold his shirt up to his neck. The heart is auscultated, and aneurysmal pulsation looked for; then a general inspection is made for hernia, &c., and Romberg's test applied, inquiry also being made as to fits; then the visual tests are employed.

1. As regards *eyesight testing*, the original instructions for the medical inspectors stated that “only officers and deck hands were to be tested for form and colour tests.” Thus firemen and stewards were exempted. So far as colour-vision is concerned, this is only natural, but defective eyesight, at least if marked, in any employee on board ship may have serious financial consequences for the owner, not, of course, from risks to the vessel's safety, but from the liability to permanent blindness resulting from even slight injury or disease in a patient who is quite unable to secure skilled treatment at the proper time. Cases of iritis, corneal ulcers, or even foreign bodies, depending upon the care(?) of a fellow-employee in the stokehole, are more than likely to eventuate in permanent damage to the eyesight, so that, from a compensation-risk point of view, a good standard of eyesight is necessary, even in firemen. Unfortunately, it is, I find, not easy to test firemen by the ordinary types, even when allowance is made for the effects of alcohol and tobacco. It is a common complaint that, owing to the constant exposure to the glare of the furnaces in the dark stokehole, they cannot see letters clearly at a distance. Personally I am inclined to advise the rejection of a fireman who has

practically only one eye available for distance vision, owing to the risk run by his employer of having to compensate him for total incapacity for work should the good eye become markedly defective at sea from accident. There is, moreover, the greater liability of any man with defective vision to ordinary accidents from tripping over ropes, &c., in a bad light. I should here add that the examiner merely can *recommend* rejection of any candidate for any cause; it is open to the captain to take whom he pleases for his crew, but the likelihood of his taking a defective man is not great when the deficiencies are recorded by the doctor and explained to the officer in charge.

As regards officers and deck hands, the Board of Trade at present does not require the eyes to be tested separately (though this will be required after 1st January 1914), and the standard presently required is that more than half the letters in the fifth line of the test Snellen's sheets must be read correctly at 16 feet. Unless I notice that there is apparent inequality of the visual power in the two eyes or any visible corneal injury, I do not test the eyes separately. Sometimes one has a little difficulty with foreigners in regard to reading the types, but a more important point is the case of the seaman—who occurs fairly frequently—who is very defective at making out the test types, and yet is said by his officers, to whom the case is reported, to be “very good at picking up the land or lights at sea.” His real *far* vision or “look-out” power is apparently much better than testing by Snellen's types would bring out. I suppose the explanation is that his *light sense* is better than his *form vision*, and that it is the light sense which is relied upon greatly in “look-out” duty. I think this condition is commoner among older men, but not by any means confined to them. Out of 930 men examined in 1910 I find there were 28 noted as “defective,” of whom 6 were “rejected” after the officers had the degree of defect demonstrated to them. No one is allowed to be present during the medical examination of the employee, but when defective vision is found its presence is demonstrated to the officer in charge, who is called in for that purpose in order that he may decide whether the man will be accepted by him for service or not.

For testing *colour vision* wools are used, but instead of asking the candidate to select the wools of the same colour as the standard in his hand, my practice is to show him a red or a green skein, and on his naming this correctly, I then ask him to pick out some more reds or greens (as the case may be), *while*

*I conceal the original skein.* I am quite open to correction on this matter, but my reason for employing the test in this manner is that what is required of the seaman is to pick up a red or a green light *individually* at sea, not *by comparison* with a light of similar colour. I am well aware of the divergence of opinion which exists as to the methods which should be employed in testing the colour vision of persons who have to work with *lights* and not with *wools*, and personally I shall be very glad if anyone present can give me his practical experience of the marine telechrome used by the Admiralty, or the method advocated by Edridge Green; but what I feel is, that while accuracy in comparing colours may be most important in painters or some shop assistants, what is required of a seaman is that he should be able to recognise at once, *without any comparison*, any single individual light as green, red, or (so called) white. That coloured lights may take different tints in a foggy or misty atmosphere is, I suppose, admitted by all, and the most *practical* method of testing the colour vision would seem to be to try the man at sea with actual lights in various weather conditions, but speaking as a landsman, I trust there is no likelihood of this method of testing being introduced. I make no pretensions to being either an oculist or a physiologist, and shall gladly welcome any suggestion as to how best to test for and eliminate the colour-blind seaman. I notice that Dr. Freeland Fergus holds strongly that defective colour sense *per se* is not a source of real danger in navigation unless defective light sense is combined with it.<sup>1</sup>

In 1910 I find 12 men noted as defective in the colour test, 5 being rejected, but, since a large proportion of the crews had been examined more than once, several others had doubtless been weeded out in previous years. It is amusing to find that the stock adjective used by Orkney and Shetland men to describe a coloured wool of whose tint they are uncertain is "mauve," the varieties of mauve being sometimes astonishing. A large proportion of my defective-colour candidates occur amongst men from these islands.

2. *Hernias* occasion the rejection of a goodly proportion of the men. When the hernia is small, and kept up by a well-fitting truss, the man is usually passed (though noted, of course, in the books to prevent his claiming afterwards for its appearance), but I must own I have often some doubts if he should be passed, for even though the truss be really *worn* (and not, as is too often the

<sup>1</sup> *Glasgow Med. Journ.*, June 1910.



case, kept in his trunk) it is not always effective in severe straining efforts, and cannot be replaced at sea if it breaks, and the excessive sweating of a fireman soon rots the covering and rusts the metal. I notice that Dr. R. J. Collie goes so far as to say (in a paper read at Brussels)<sup>1</sup> that if he were an employer he "would never employ anyone with hernia, even though he wore a truss," and I presume he is speaking of shore labour.

On the other hand, if a radical cure has been performed, should the man then be passed as satisfactory? I am aware that the wearing of a truss after "radical cure" is discouraged by surgeons, but is a man who has had "radical cure" performed really no more likely to develop hernia again than one who has never had a hernia? I must confess I feel inclined to order a man who has had a radical cure performed at least to possess a truss, for use if bulging again begins to show itself (though he may not wear it before this), especially if the voyage is a lengthy one. I shall be glad of advice on the following points, viz.:—(1) Is the risk of strangulation as great in the case of old-standing hernia as in the *newly* developed? (2) Should a man with a small umbilical hernia be rejected? (3) Does strangulation occur at all often in the hernial protrusions at abdominal scars? It is very striking to see the frequency of the signs of the abdominal surgeon at work on the appendix, stomach, &c. In one crew of twenty I noted three appendix operation scars.

3. *Venereal disease* does not bulk so largely as the reputation of seafaring men would lead one to suppose. Out of 930 men examined in 1910 there were only 7 rejections from this cause. Of course these figures refer only to cases of acute disease, and do not include cases of slight gleet.

4. As regards *varicose veins*, it is rather difficult to know how to act. Unless they are very pronounced, the man is generally passed on condition that he wears an elastic stocking, which at least acts as an extra protection from injury if not of any remedial benefit. I should be glad of some surgical opinions as to the question of advising operative treatment in cases where it is more a diffuse enlargement of veins around the calf than an enlargement of the main trunk. The condition is very common, especially among firemen.

5. *Heart and Vessels*.—As regards valvular disease, if compensation is well established I usually pass the man, noting the

<sup>1</sup> "Medico-Legal Aspect of the British Workmen's Compensation Act, 1906." London: Baillière, Tindall & Cox.

condition, of course, in the book for reference, unless the voyage is a long one, when I advise the man to seek another ship. Aneurysm is really one of the most difficult problems, and all the more since the House of Lords' judgment that rupture of an aneurysm in a man occurring when at work, even though the evidence clearly showed that it might have ruptured when in his bed, entitled the relatives to compensation. I am not versed enough in the law to say whether, in the case of a seaman who sleeps at the scene of his work, rupture occurring when off duty altogether would entail compensation being paid in that case also. The detection of an intra-thoracic aneurysm in its early stages is always difficult and well-nigh impossible in the brief medical survey of a crew, so that it is only the visible pulsation that would call attention to it, unless the coughing induced in testing the man for hernia showed the characteristic sound.

Before passing on to refer to the medical examination of employees who have met with *injuries*, I should like to say a few words on an important allied question, viz. examination of an employee who has been off, through *illness*, to decide on his fitness to resume work. I have not had much experience of this, but the importance of medical reporting on an employee was brought forcibly home to me recently. I was asked to examine on the same day two employees who had been off work suffering from "cardiac debility," according to their respective medical attendants' certificates. My opinion was sought on the question as to whether this condition entailed any special risk to the employer. The reason of their being sent for examination probably arose from the following circumstances:—A man was employed chipping paint inside a vessel's hold, for which purpose he stood on a staging about 4 feet high. Suddenly he was seen to drop his hammer and fall between the staging and the vessel's side, and was picked up dead. The employer's view was that the man fell in the act of dying, but probably because no post-mortem examination was held, and it would have entailed considerable expense to fight the case (irrecoverable if it was gained), I think a sum was paid, though without admitting liability. It is not unnatural, therefore, that an employee who has had "cardiac debility" should be sent for examination before being taken on again, and what did I find? Both were men of about 55, but while the one had had recurring attacks of dyspnoea and debility for 15 years, with irregularity of cardiac action, the other gave a history of marked anginal attacks of recent date and had a very high tension pulse, his pain coming

on with any exertion. I felt bound to advise the employers that as regards the latter man they ran an undoubted risk of his death occurring suddenly at his work or elsewhere, and I shall be glad to hear any opinion of my advice. If "contracting out" was allowed, this is a type of case eminently suited for such treatment, as I know the firm are very averse to throwing the man idle.

As regards examination of employees *after injuries*, I have little time left to speak, but many of those present, especially those acting for insurance companies, must have a much wider experience than mine. Last year I find I reported upon fully 60 cases of injury—several being seen, of course, more than once. I should just like to refer to three difficulties met with, and I place first a very real one, viz. the difficulty of getting the *after-treatment* of the patient carried out when the man has ceased attending hospital. For instance, a man was treated in the Infirmary for a bad compound fracture of the leg. When seen by me nearly six months after the accident he was still using his crutches,<sup>1</sup> never having tried to put his foot to the ground, and he had never been back to the ward since the plaster of Paris was removed. Little wonder the ankle was stiff, and the prospect of resuming work far distant. He was under no medical man's care, for he had no doctor of his own, and I had no power to *treat* him; his *fracture* having united, the house-surgeon's duties to him, I suppose, had ceased. Now, cases like this occur fairly commonly, and until the law allows part of the compensation benefits to be expended by the employer in getting the man fitted for his work, it seems to me that the only other measure is to try to get the house-surgeon to keep the man still in attendance for the injury until the *after-results* are also removed. He can insist on adhesions being broken down; it is not likely that the employee will pay for a doctor of his own to come and do this. When the employee is in a Friendly Society this trouble does not arise, but a large proportion of the men I have to report upon are under the supervision of no doctor at all. Another difficulty, more financial than medical, I have met with more particularly in the case of dock labourers injured while handling ships' cargoes. Being largely of the casual labouring class, many of them live in lodging-houses or in very poor quarters, and have nothing but their half-pay compensation money to live on. The result is that I have not infrequently found a man, who is in poor physical health as well as suffering from some

<sup>1</sup> When seen again, eleven months after accident, was still using crutches.

surgical injury, unable to purchase the medicines prescribed for his relief: or, living in a lodging-house, unable to rest the debilitated heart and prevent recurring œdema of the legs. Such cases would really improve rapidly if good feeding and medical remedies were supplied in some institution, and I cannot help thinking that some of them are much more really suitable cases for charitable treatment in hospitals than many of their well-off inmates. The last difficulty I shall refer to concerns seamen especially, and that is the difficulty of starting them after an injury with any kind of "light work." An A.B. must be "able-bodied," or he is not merely of little use at sea, but, from the hazardous nature of much of the work, may be a source of compensation risk to his employers. In spite of partially stiff fingers, for instance, or the loss of portions of fingers, he is quite able for much of the work aboard, but since he cannot, when required, "climb aloft in a howling gale," it means practically that the vessel is shorthanded owing to his presence. Of course a man with such disabilities often becomes a stoker, or can take up work ashore, but if he declines this it is difficult often to certify when he is able to return to *his* employment. For instance, a seaman lost the fourth and fifth digits of the left hand at the first interphalangeal joint through injury with a wire rope: though the rest of the hand is quite good, his gripping power is so lessened that he cannot pull himself up or hang on by a rope, and is thus permanently unable for the whole work of an A.B.

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## A NATIONAL MEDICAL SERVICE.

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A FEW years ago to suggest such a thing as a State Medical Service analogous to State Education or the National Post Office would have induced little more than a tolerant smile. These days are gone. The subject is now being excitedly argued by the medical profession, and is rapidly becoming a matter for parliamentary action. Two factors have tended to bring this about. The first of these is the Report of the Poor Law Commissioners, who were unanimous as to the need for reform. Coupled with this, and hardly separable from it, is the agitation for invalidity insurance. The second factor is the lately established scheme for the medical inspection of school children.

Some degree of medical aid is indispensable in an invalidity insurance scheme. How it is to be supplied is a question not yet answered, and one which many would gladly shelve. Unfortunately for them the second factor, medical inspection of school children, with its unexpected and far-reaching sequelæ, is forcing the pace, so that in another couple of years the calls for a solution of the problem will become uncompromisingly insistent. It may be asked how is this? The reason is simple. According to the medical officer to the Board of Education (Annual Report, 1909, p. 27): "It may, however, be stated generally that in respect to the six million school children in the Public Elementary Schools of England and Wales, about 10 per cent. of them suffer from serious defect in vision, from 3 to 5 per cent. suffer from defective hearing, 1 to 3 per cent. have suppurating ears, 8 per cent. have adenoids, or enlarged tonsils, of sufficient degree to obstruct the nose or throat and to require surgical treatment, 20 to 40 per cent. suffer from extensive and injurious decay of the teeth, 40 per cent. have unclean heads, about 1 per cent. suffer from ringworm, 1 per cent. are affected with tuberculosis of readily recognisable form, and  $\frac{1}{2}$  to 2 per cent. are afflicted with heart disease." Of these vast numbers only a small percentage receive treatment, and a still smaller number adequate treatment. Of this there can be no doubt. The nation is now informed of the physical state of its child population. In future without treatment inspection is robbed of its proper fruits, of its value, even of its *raison d'être*. But

attempts are being made to have these defective children treated. A study of these efforts is illuminating and serves to show how it is that the problem of the supply of medical aid cannot much longer wait an answer.

In the first place a great diversity of agencies is at work. These include education authorities, public health authorities, after-care committees, and voluntary workers in great variety. Their efforts are not marked by any uniformity. Each is doing what seems to him good, and much that is done will no doubt be found later to be ill advised. There seems to have been a great lack of what Lord Haldane calls clear thinking. There are clinics supported by the Education Authority or by charitable persons undertaking to treat, sometimes gratis, again at a small charge, one or more of the groups of defects from which children suffer. Similar work is being done at a price by arrangement with hospitals, an experiment which has not been marked with great success, judging by the London results. There is a diversity of means, of methods, and of results.

No sufficient assessment of results has yet been made. When it is, it will only serve to emphasise the gigantic nature of the task, and that the efforts so far made to cope with it are tentative, experimental, and puny. In the mere matter of teeth alone it has been stated that there are not enough dentists in the country to deal with the school children, over 90 per cent. of whom reveal, when inspected by a dentist, a need for treatment. It will then be seen that this is no task for charity or for an education committee, even if it were assisted by grants from the Imperial Exchequer. Committees already groaning under heavy financial burdens, and with ample work of other kinds more truly pertaining to them, would welcome the transfer of this task to the State. We conclude, then, that the duty of treating the children found defective is too great to be shouldered by any but the State.

But the State may be forced to take up this task. We have heard lately of hospitals refusing to treat school children. If this attitude became general, medical inspection of school children would be rendered useless, for the children cannot afford to obtain treatment elsewhere, and the treatment they require is specialist treatment to an extraordinary degree. That this attitude on the part of the hospitals or at least of their medical staffs should become general is very probable and only right. It cannot be expected that the medical profession will submit to being

exploited any longer for the public benefit. It cannot accept the position of being charitable to the State, of undertaking what is coming to be recognised as the State's work. The medical profession then may force the State to undertake the task of amelioration of defective children.

Assuming that the State does undertake the duty, will it not at the same time undertake the treatment of all who cannot afford the luxury of a private medical practitioner at the standard rate of fees, in short of all whose incomes do not touch the minimum income tax limit?

In a recent speech Dr. E. Rowland Fothergill, while discussing the possible modes of contract under which medical men would undertake work in a State Sickness and Invalidity Insurance Scheme, dismissed with scorn the proposal to have a whole-time medical service. He proceeded to say: "It can be taken that the large majority of the medical profession would be absolutely united against it, and they would decline to co-operate in any way in such a scheme." Mr. Smith Whitaker was possibly more discreet when a few weeks earlier, in a speech at Cardiff, he confined himself to what was a skilful statement of the position, for we venture to think that the possibility of a State service cannot be thus lightly barred from discussion. It is significant that Mr. Smith Whitaker went on to say: "Another very possible solution, one which you must always have present to your minds in consideration of this subject, is that those who have advocated, as in the Minority Report of the Poor Law Commission, the employment of whole-time salaried medical officers by each local authority are not unlikely to press the same principle on the notice of the Government in this matter of State sickness and invalidity insurance. An influential section," he proceeded, "of the general community are in favour of applying the principle of the Civil Service to medical practice."

This influential section is steadily growing, for we have now in the County Council's Association Scheme of Poor Law Reform yet another straw to show which way the wind is blowing. This scheme is a compromise between the Majority and Minority Reports. Briefly, the suggestion is to make the administrative county the unit of area, the County Council the supervising authority, and its medical officer responsible for its poor law infirmaries and supervisor of all district medical officers. One man would then administer sanitation and public health, medical inspection of school children, and medical relief for the poor of the

county. In this, its medical part, the scheme is to all intents and purposes identical with that of the minority of the Poor Law Commissioners. The conception of a county medical service in which medical officers of health, sanitary officers, school doctors, and poor law medical officers are units working under the direction, supervision, and control of the county medical officer has come to stay. Certain sequelæ would follow the adoption of such a scheme, and these we must consider. The past history of the public health and school services suffices to point the way. The tendency in both these services is towards appointing the whole-time man. Rightly or wrongly, the Local Government Board favours whole-time appointments in the public health service, and to this end it advocates the grouping of adjacent districts into whole-time areas, and the splitting of larger ones of unmanageable size which are already whole time. In school work only two years' experience has shown the desirability of whole-time appointments, so much so that each year the number of men engaged in the work diminishes owing to the squeezing out of the part-timer. Local authorities know that whole-time officials are the best for their purpose. They are much more easily controlled and supervised, and they have no other interests save those of their committee to serve. If not at first, certainly later, the county medical service will have a whole-time staff.

Furthermore, a large medical staff would be required, for many who now go without medical treatment would require to receive it. But the size of the staff would vary with the scope of the scheme. It might be that the services of the county officers would be confined to paupers and school children, or it might be extended to include that large class for whom sickness and invalidity insurance is intended, *i.e.* all those whose incomes are under £160 per annum; in the event of which the wholesale conversion of the medical profession into a civil service would be involved, and private practice as now known would persist only in the west ends of large towns and in popular rural residential resorts.

School work is shedding light on yet another problem. In district after district the private practitioners have offered to undertake the treatment of the children found defective, but authorities already recognise that the whole-time specialist is the best man for the work. There is little doubt that the same principle will obtain when the county medical service is established. Poor law infirmaries will be staffed by men skilled in the several departments of medicine: pathological material will be



sent to the county laboratory; eye cases will be referred to the county oculists; the county surgeons will be available for operations. The old *laissez faire* policy is dead as the dodo. Under the county scheme the sick will actually be treated by the best skill available, and a medical man will no longer be expected to be competent to deal with all the disorders of the human body. An immediate raising of the standard of practice and rapid advances in knowledge would ensue, but voluntary hospitals would be doomed.

The county medical officer's duty would be to co-ordinate the work done in all the fields of public medical effort, including, as they would, sanitation, school inspection, and the treatment in hospitals, infirmaries, and at their homes of a large section of the population.

This, and no less, would be the result of the development of the conception of a county medical service, and the control of it is to be in the hands of a composite body recruited from the County Council and the existing Boards of Guardians within the county.

As Mr. Whitaker has said, an influential group, and, it may be added, a growing group, desire the conversion of the medical profession into a civil service, and opinion is becoming crystallised that such a service should be organised on county lines. Even now many consider gross changes in the forms of medical practice not far distant, and the scheme outlined above is a popular one. It would be useless to attempt to stem the rising tide, but much might be done to direct it into favourable channels. It may be well, therefore, to consider whether, if we must have a State service, it might not be developed with advantage on a still broader basis, as a national service with central departmental control. We have already in the Indian Medical Service and the Royal Army Medical Corps services organised on these lines, and for many reasons these are to be preferred to the suggested county organisation. We venture to think that far from the profession being opposed to such a scheme, it is one about which "a large majority of the medical profession would be absolutely united" *in favour of*.

Centralisation is a marked modern tendency in all State services. Already education authorities are little more than mirrors to reflect the decrees of the Board of Education. They are closely scrutinised administering bodies without wide powers of initiation. In public health matters the same tendency is at work, as witness the recent arrangement whereby the Local Government Board receives reports of infectious disease incidence

weekly and issues a weekly return—a task until January undertaken by county medical officers for their several districts. And, again, in the case of the rat plague in Suffolk and in adjoining counties, we see the Local Government Board requiring, quite rightly, to be dealt with at first hand, and undertaking the bacteriological examination of animals. It would be advancing this tendency a step further to have a centrally controlled service. It may also be urged that county councils even now are overburdened with work, and that a limit may very soon be reached beyond which they cannot exercise intelligent and thorough control of the work being carried out in their name.

The cry for payment for members of Parliament has now been raised, and doubtless will soon be heard from the members of other public bodies who, if paid, would become part-time public officials. A part-time system is always second best, so that a paid whole-time central administering body would be probably cheaper and certainly more efficient than a congerie of part-time bodies working on varying lines.

The main argument, however, in favour of centralisation is efficiency. Centralisation of authority and control is essential for uniform and efficient action. With centralisation of control must go delegation of responsibility, and this is apt to be forgotten at the present time. The tendency is to centralise in the county medical officer all authority and responsibility. This is especially true of school work, in which the county medical officer is recognised by the Board of Education, and is the responsible head of the work in his area. On him falls all the burden and heat of the day. It is bad for him, it is worse for his subordinates, who might easily become in time colourless automata.

In a national scheme all authority would be vested in a central department composed of fragments of the present Local Government Board, Home Office, and Board of Agriculture, staffed by professional and lay members, with a professional head responsible to a Cabinet minister. From here all sanitary, preventive, therapeutic, and research work would be directed, each officer being responsible in his own area to his immediate chiefs, and so to the central organisation. In this way all the forces for the fight against disease would be efficiently arrayed. The cost would be great, but who can say it would cost more than the proposed county scheme, or the incalculable sums spent in the present haphazard methods. As to efficiency, who can deny that such an organisation is the best.

From the medical man's point of view the terms of service would almost certainly be congenial. Entry as for other branches of the civil service would be by examination, and men would thereafter be drafted to vacant areas. As in the army, it would be open to men to take to that specialty or branch of the work for which they were most fitted or inclined. Pay and promotion would depend on merit and length of service. There would be no preference shown to the workers in any particular branch, and the laboratory man would be as much esteemed as the brilliant surgeon or the rural officer. There would be wholesome discipline, but no necessity for trimming or for subordination to a reactionary council. The work would be done without fear or favour or loss of dignity. The present unedifying scramble for appointments would be done away with, as likewise the unequal distribution of rewards. The health army of the country would be organised to a fine degree. All effort would receive its full fruits, because of unity of organisation and administration, uniformity of action and of purpose.

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EDINBURGH MEDICO-CHIRURGICAL SOCIETY.<sup>1</sup>

## A DISCUSSION

## ON

## DUODENAL ULCER

## ITS DIAGNOSIS AND TREATMENT.

## INTRODUCTION

## BY

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Our knowledge of gastric and allied affections has been of recent years strikingly advanced by the freedom with which abdominal exploration has been practised in order to combat certain symptoms, to substantiate a diagnosis, and to establish a definite line of treatment. Hence our appreciation of the relative value of certain symptoms has been increased, and we are now in a better position than formerly was the case to judge the rôle they play in guiding us to a definite conclusion, and we can with greater accuracy recognise special ailments and the treatment appropriate to each.

While the arduous act and the short life might hopelessly delay advance, the co-operation of earnest workers and keen observers is continually requisite to aid the formulation of data on which to base an exact diagnosis.

In requesting the individual experience of our medical brethren on the subject of duodenal ulcer we must bear in mind that our attention should be concentrated upon and mainly limited to the ordinary type of the lesion, with its associated indigestion and complications, as distinguished from those varieties called forth by special forms of trauma and general toxæmia.

*Symptoms of Duodenal Ulcer—Diagnosis.*—It has been asserted that certain prominent symptoms may be grouped together as peculiar to duodenal as distinguished from gastric ulcer. We must acknowledge our gratitude to the Leeds School for this important symptomatic differentiation, and more especially to Mr. Moynihan, who by his stimulating, dogmatic, and bold pronouncement has given us a lucid text. Moynihan holds that a

<sup>1</sup> 1st March 1911.



Careful elucidation of certain subjective symptoms, apart from any objective examination of the patient, may lead us to form a correct diagnosis as to the existence of duodenal ulcer; that is to say, he believes that in typical instances there will be found a long-standing history of intermittent dyspeptic attacks, aggravated during the colder seasons, occurring chiefly in males from 25 to 45 years of age, characterised by gastric discomfort and pain which follows 2 to 6 hours after the chief meal, is frequently also nocturnal, gives rise to a sensation of hunger, and is relieved by taking food. Hæmorrhage, a late development, takes the form of mælena; and vomiting, infrequent, becomes more pronounced as stenosis, due to cicatrisation, progresses. Beyond local tenderness present in some cases, we are informed that there is no objective symptom of substantial value, and it is indicated that a test meal usually shows less free HCl than is normal.

We are thus presented with features differing from those commonly occurring in gastric ulcer, where pain arises shortly after taking food, is not alleviated by eating, and is more frequently associated with hæmatemesis and vomiting, and an increased amount of HCl.

While we admire the happy terms and trenchant style in which Moynihan expresses the duodenal syndrome, we are not clear as to the ease with which, from symptoms alone, we can define the position of ulcers which lie in such close neighbourhood to each other as on one or other side of the pylorus. We are ready to welcome and to admit the truth of the general statement, although we encounter cases where, with Moynihan's typical symptoms, there may be no duodenal ulcer, and, again, where there may be ulcer and no symptoms. Do the exceptions prove the rule?

An illustrative case is as follows:—Mrs. X., æt. 45, developed gastric symptoms in summer 1909. Epigastric pain, of a dull, gnawing character, came on  $2\frac{1}{2}$  to 3 hours after meals, and was invariably relieved by taking more food. This pain has persisted for the last eighteen months with varying severity, and latterly she has been able to control it by taking sod.-bicarbonate and Gregory's powder. She has been greatly troubled by nocturnal pain, and has been in the habit of taking some form of nourishment—*c.g.* soup—at 2 A.M., and she frequently eats biscuits in the morning about one hour before breakfast to stave off the epigastric pain. There has been no vomiting. She is fairly well nourished, but has lost much weight.

From a general consideration of this case, and the fact that no epigastric resistance was palpable, and that the test meal contained no free HCl, the correct diagnosis of carcinoma was made. The disease involved the lesser curvature and pyloric antrum, and was at least one inch remote from the pylorus.

Some of us also can recall cases of perforated duodenal ulcers in which antecedent symptoms were lacking. We may leave to the physicians the important task of indicating the more salient points in diagnosis which enable them to differentiate between the allied forms of ulceration, hyperchlorhydria, and the various types of dyspepsia due to latent or hidden appendicitis and to cholelithiasis, since they are chiefly concerned with the early manifestations of these affections in which there is so much room for the exercise of diagnostic acumen. We believe that with the knowledge we have already gained as to the mimicry which frequently obtains between such troubles, that an application of general principles following on careful examination and consideration of each case as a whole should preclude error even under difficult circumstances. Here we may note that the test meal in duodenal ulcer has generally yielded rather an excess of HCl.

We also look to the physician for information as to the best lines on which to conduct the treatment of duodenal ulcer, since we have no doubt that, in its early stages at least, healing may take place under such measures. The fact that recurrence may occur after an apparent cure by the physician, just as this may also follow after—probably more rarely—successful surgical intervention, raises a suspicion that we have not yet arrived at the primal cause of the malady. It has been recognised that duodenal ulcer is most prone to originate in the first part of the duodenum, and becomes less frequent as we recede from the area which receives the acid outflow from the stomach. We require to know the factors which influence the peculiar sex-incidence, and the cause which leads to the initial death of tissue which leaves an ulcer obdurate to heal as long as it is washed by the acid gastric secretion.

Is the ulcer mainly of embolic, toxic, or traumatic origin? Is the geographical distribution limited by race, country, or dietary habits?

It might be supposed that surgical exploration would always reveal to the experienced touch and sight clear evidence of an existing ulcer. Yet failure in this respect has been followed by actual demonstration of the lesion after death. We have observed much variation in the conditions exposed, chiefly in degree, as would be expected.

I. Silvery white patches, occasionally somewhat stellate in outline, superficial, with the very slightest or no trace of induration.

II. Cicatricial puckerings with adhesions and pouches, along with varying degrees of stenosis. We have only rarely met with crateriform thickening.

III. Large tumour-like inflammatory thickenings adherent to the liver, gall-bladder, and omenta, definitely free from, and not merging directly into, the pylorus. Such conditions may by traction evolve symptoms which complicate diagnosis.

The surgical treatment of duodenal ulcer consists primarily in the formation of an anastomosis between the stomach and jejunum, and usually takes the form of von Hacker's posterior gastro-jejunostomy. The curative effect is ascribed to the local rest given to the affected area. It is practically a system of drainage whereby the irritating gastric contents are diverted from the normal route through the pylorus and duodenum. In addition to this, the alkaline contents of the duodenum carried by the afferent loop mingle with the stomach contents and mitigate their acidity.

It is possible to witness the action of the stomach when disposing of a bismuth meal in the living human subject, and this has been beautifully illustrated by many writers.

We know by experience that the natural functions can be well performed after loss of the pylorus, for example after the operation of pyloro-gastrectomy for carcinoma.

So also it has been shown that the aperture in gastro-jejunostomy may function as a pylorus until such time as the ulcer heals. Moreover, Mauntz cites and figures examples taken from individuals in good health, in whom, after a gastro-jejunostomy, the new aperture preserved its function as the main channel, many months after the ulcer had healed and the pylorus had regained its tone.

We have no desire at present to emphasise the surgical aspects of treatment, nor are we about to detail the various forms of anastomosis which have been advocated, and the reasons for their selection in given cases; nor shall we discuss questions as to the size, site, and suturing of the anastomosis, important though such questions be. As a rule, posterior gastro-jejunostomy is employed as the principal curative agent; but while it is thus regarded, many surgeons are of opinion that with it may be combined some adjuvant attack on the local lesion in the shape of excision of the ulcer, infolding or inversion of the affected area, or even closure of the gastric outlet; others, again, have not hesitated to com-

pletely excise the whole affected duodenal segment, following this with end-to-end suture.

That such measures should become a matter of routine we gravely doubt. Excision in any form means increased risk. In regard to closure of the gastric outlet, we may admit that this might ensure greater rest to the affected area. It is, however, questionable if the gain is so marked as would appear at first sight, since in the presence of a gastro-jejunostomy all the food is apparently transmitted by the new route only, and the pylorus does not permit the gastric contents to traverse the duodenum until healing of the ulcer has taken place. A disadvantage is conceivable that in the event of cure a beneficial return to the normal may be prevented by this antecedent artificial closure of the pylorus.

It may, however, be urged that closure of the pylorus prevents a *circulus vitiosus* developing. The once dreaded *circulus vitiosus* is not met with now in well-planned cases of gastro-jejunostomy, and, besides, there are other factors than a *circulus vitiosus* which makes for bilious vomiting after such operations. It may again be advanced that greater security is afforded to the patient, and that by such additional precautions there is less opportunity afforded for a return of ulceration. We have, however, to bear in mind that under no circumstances, however successful it may be generally, can we regard the treatment of duodenal ulcer by surgical means as absolute. Recurrence may take place—it may be at a different site—and while we happily possess no personal acquaintance with these misfortunes, such instances have been reported. Nor has it yet been established that the many tempting additions to a simple gastro-jejunostomy have lessened this tendency in any marked degree, and we know that return has taken place in spite of their use. We await the verdict of further experience on the value of such operative additions.

The results of operation for duodenal ulcer are brilliant. We cannot recall a single instance where a gastro-jejunostomy for duodenal ulcer was followed by recurrence. A return to the normal standard of gastric secretion has been frequently noted years after operation. On one occasion where we required to reopen an abdomen we observed that a hard fibrous mass which formerly occupied the first part of the duodenum had completely disappeared, and that both the pyloric and anastomotic apertures were patent. We have had no experience of melæna requiring direct ligation of a bleeding point in duodenal ulcer. In one



case of gastro-jejunostomy for a definite duodenal fibrous mass—left undisturbed—the operation was immediately succeeded by severe pain and symptoms which simulated those of perforation. The pallor, small pulse, and lack of abdominal rigidity gave one a key to the situation, and the evacuation of huge quantities of blood proved what had occurred. The patient did well.

Perforation of a duodenal ulcer exhibits symptoms which, as a rule, differ in degree from those of similar gastric lesions near the pylorus. The history—or it may even be the lack of any antecedent history of indigestion—the right-sided pain and tenderness, may aid in concluding as to the exact diagnosis, although it is not always possible in such urgent circumstances to discriminate between gastric and appendicular perforation, more especially when we bear in mind possible irregular positions of the appendix.

As compared with gastric ulcer, the aperture is usually smaller, there is less escape, and the fluid discharging gives an alkaline in place of an acid reaction. We have a constant guide in the pyloric veins to the relative position of duodenal ulcers.

Closure of the ulcer may of necessity entail a gastro-jejunostomy, and this we think should be carried out forthwith in every case if possible.

### *DISCUSSION.*

DR. WILLIAM RUSSELL said that of recent years there had been a great deal of confused writing on the subject of duodenal ulcer, and it had become surrounded by an obscurity and even mystery which Mr. Caird's paper and the subsequent speakers might have some effect in removing. He could not do more than attempt to submit some propositions which were the result of his own experience. The first proposition was that duodenal ulcers were in all respects analogous to gastric ulcers; there were the acute, the chronic, and the perforated ulcer. Both duodenal and gastric ulcers were commonly associated with, or preceded by, marked disturbance of gastric function. That, however, like every other proposition in medicine, had exceptions. The commonest form of gastric disturbance was associated hyperchlorhydria. What the precise steps of the ulcerative process might be he did not attempt to discuss. One point he thought it necessary to bear in mind was that both acute gastric and acute duodenal ulcer might be a very superficial erosion, and that this superficial erosion might be, and often was, associated with hæmorrhage both in the stomach and duodenum. When approaching the question of the diagnosis of duodenal ulcer one must be able to differentiate between the forms of functional gastric disturbance and be able to satisfactorily

treat these various conditions, because on the effect of treatment, in fact upon the failure to remove symptoms, might hang the diagnosis of the existence of a duodenal ulcer.

An acute duodenal ulcer frequently came on in the course of an attack of hyperacidity. He repudiated Moynihan's view that hyperchlorhydria had no existence, and that the so-called symptoms of hyperchlorhydria were invariably due to duodenal ulcer. Within the last few months he had had under observation 3 cases of duodenal ulcer with marked melæna, all of which recovered without any serious difficulty, under appropriate diet and medicinal treatment. One patient was a man in active business who could not even go to bed, and in spite of that he made a complete recovery, in the sense that his melæna and other symptoms rapidly disappeared. He held that in acute duodenal ulcer, as in acute gastric ulcer, complete and speedy recovery occurred. The fact that one could not arrest the melæna and the pain coming on two hours or longer after food was an indication, often a proof, that one was dealing with duodenal ulcer. That brought up the second point, namely, the question of chronic duodenal ulcer.

Certain persons thought that they could readily cure chronic duodenal ulcer as well as chronic gastric ulcer without gastro-enterostomy. One did not wish to be uncharitable, but evidence came before one from time to time which seemed clearly to show that cases of chronic duodenal ulcer were cured which never had any existence; all that had been the matter was really a functional gastric disturbance, which had yielded, no doubt, to appropriate treatment. When he was satisfied that a chronic duodenal or a chronic gastric ulcer existed, he did not consider it worth while spending much time in trying to heal it medically; he had spent some weeks over various duodenal ulcers in the hope of success, and probably if the treatment had been carried on for months it might have been attained, but in cases in which he was satisfied that a chronic duodenal ulcer existed he advised operation, as these cases were most promptly healed by having a gastro-enterostomy performed.

With regard to perforated ulcers there was really no difference of opinion. A perforation whenever it occurred required laparotomy. Mr. Caird and he had recently to do with a case of perforated duodenal ulcer in which the earlier symptoms of acute duodenal ulcer had been ignored in spite of melæna; this ulcer had come on after a prolonged period of hyperchlorhydria. His contention was, as he had already said, that hyperchlorhydria was a common precursor of duodenal ulcer, but it did not of course follow that in all cases of hyperchlorhydria there was duodenal ulcer.

Dr. Dewar (Dunblane) said he would like to ask Mr. Caird if he had noted any history of heredity in his cases. He (Dr. Dewar) was

intimately acquainted with a family in which the grandmother died of either a gastric or duodenal ulcer. Her family of six grew up to adult life: three suffered very severely from dyspepsia all their lives. Out of this family of six four had married, and two of these (one being a dyspeptic and the other not) had families. The family of the dyspeptic consisted of four, two of whom had had gastro-enterostomies and the other two had perfect digestions. The family of the non-dyspeptic consisted of two having perfect digestions.

Dr. Russell's remarks were interesting, but he could not quite endorse them. Personally, he had been subject to dyspepsia all his life. The first symptom of ulceration began with melæna, after which he had intervals of tolerably good health, alternating with attacks of discomfort, never pain, in which he could hardly digest anything; these attacks were followed by periods of good health in which he could digest anything. He did not believe the ulcer in his case had ever healed from the time it began, notwithstanding the long periods of really good health and comparative freedom from discomfort. Finally, one night an attack of vomiting occurred and persisted uninterruptedly for nearly a fortnight, until he was operated on. It was a duodenal ulcer.

Although he was satisfied that he was really better than he was before the operation, he had not had that entire clear record which Mr. Caird described. It was now more than two years since the operation, and in that time there had been two attacks of melæna: he believed, however, that these had been brought on by violent and unusual exercise. He has occasional attacks of spasm, and occasionally dyspepsia. He found nothing relieved pyloric spasm quicker than inhalations of chloroform.

He also asked Mr. Caird if he had observed any marked diurnal variation in the amount of urea. Dr. Dewar had observed in his own case that it varied considerably from day to day.

Dr. G. A. Gibson said from a large experience of duodenal ulcer he would like to say a few words. This morning he had taken the opportunity of going over a large number of his hospital cases in his case books, with the assistance of his two house-physicians, and from these notes he found that the general belief, which had been so extremely well expressed by Dr. Russell with regard to hyperacidity, was not borne out by his experience. All of the cases he referred to were undoubtedly cases of duodenal ulcer; the lesions were seen afterwards at operations, and all of them recovered, with the exception of one who died from acute pneumonia. He found the total acidity varied from .1 per cent. to .26 per cent. The amount of free acid varied between .02 (very small) and .18 (extremely high), so that one man's experience at any rate shows that in undoubted duodenal ulcer the condition of acidity in the stomach varies within wide limits. When

there has been recent hæmatemesis or extensive melæna he would never dream of giving a test-meal and having the stomach contents examined; the risk was too great.

The possibilities of gastric spasm were very interesting. He would like to ask Mr. Caird if, as the result of long-continued spasm of this kind, there was hypertrophy of the pylorus. The idea of spasm and its possible sequels brought to his mind the interesting and philosophic suggestions of Dr. John Thomson regarding the cause of hypertrophic stenosis of the pylorus as a congenital condition.

With regard to diagnosis, he confessed he still found it very difficult to separate cases of acute and cases of chronic duodenal ulcer: even the diagnosis of duodenal ulcer, although he had met with scores of them, still remained a matter of great difficulty. Often he had diagnosed duodenal ulcer to find nothing of the kind on exploring the abdomen, but had found a chronic appendicitis: similarly he had found the condition present was simply gall-stones in the duodenum, and this with the help of all the modern clinical methods. He was therefore often inclined to doubt the accuracy of our diagnosis. He agreed with Dr. Russell that cases were diagnosed as duodenal ulcer where no ulcer existed.

The healing of chronic duodenal ulcer he was very sceptical about: an acute ulcer might heal, possibly sometimes it did heal—about that he preferred to express no opinion—but he was doubtful if the chronic ulcers healed by medical measures.

As regards treatment, whenever he suspected a duodenal ulcer he called in the surgeon: he believed in surgical treatment at the earliest possible moment. He knew of no measure which was so satisfactory as the complete closure of the pylorus.

Mr. C. W. Cathcart said he had just a few remarks to make about cases sent to his ward during the last thirteen years. These were chiefly cases of perforated duodenal ulcer, and he wished to point out the high mortality. Out of 8 cases 6 were fatal, 2 recovered. In 5 of the cases the previous symptoms were recorded—*i.e.* typical hunger pain  $1\frac{1}{2}$  to  $2\frac{1}{2}$  hours after food in 3 of them; chronic dyspepsia in 1; and only slight epigastric pain lasting for some months before the perforation in 1. He contrasted this with perforated gastric ulcer, of which they had had 25 cases in the same period: 12 of these cases died, 13 recovered, making about 50 per cent. of recoveries in gastric ulcer as against 25 per cent. in duodenal ulcer.

He believed that the subsidence of symptoms does not prove that an ulcer has healed. It seemed worth while considering that the inability to recognise or palpate an ulcer at an operation does not disprove its presence; a small ulcer on the posterior surface might be easily present without being palpable.

As regards sex, of the 8 cases of duodenal ulcer 7 were in males



between the ages of 19 and 40: 1 was in a woman of 43, and she was found at the post-mortem examination to have one healed and one active gastric ulcer besides the duodenal one which ruptured. Of the 25 cases of gastric ulcer 18 were in females between the ages of 19 and 60, and 7 were in males between the ages of 25 and 50.

Mr. Alexis Thomson said it was striking to find, on looking up one's operation-book, that the first notes of cases of duodenal ulcer, excluding those which perforated, appear only some seven or eight years ago. It was not surprising therefore that there was still a great deal to be learned regarding it. The diagnosis was often a matter of difficulty, especially in relation to gall-bladder troubles, and these might co-exist with duodenal ulcer. There is also difficulty in differentiating duodenal ulcer from lesions of the colon, such as colitis in its various phases, and, more rarely, carcinoma at the hepatic flexure.

There were several points in which duodenal ulcer differed from the gastric variety. The sex preference was extraordinary and impossible to explain. Mr. Thomson had had only five females in a series of 50 cases of duodenal ulcer in which the diagnosis was confirmed at the operation.

The second remarkable point is the relationship to cancer. It is far from rare that a chronic gastric ulcer becomes the seat of carcinoma, and although there is the same hyperacidity in both conditions he questioned if anyone present had seen the malignant transformation of a duodenal ulcer. He had had the unique experience of operating for the closure of a perforated duodenal ulcer in a patient who was also the subject of pyloric cancer. The patient made a good recovery from the perforation, and a fortnight later was in good enough condition to have the pylorus resected.

With regard to ulcers which had perforated, Mr. Thomson wished to emphasise the importance of transporting the patient in the sitting posture, and preferably by motor car. If the patient lies on his back the material which escapes through the perforation has ready access to all the sensitive areas about the diaphragm, whereas in the sitting posture they gravitate into the pelvis, where they do less harm.

Dr. J. O. Affleck said this subject was an extremely interesting one, and well worthy of discussion by such a Society as this. Even if it were not more than an interchange of opinions and a narration of individual experiences it is almost certain to bring forward facts of interest and to throw light on obscure matters.

With the main points referred to by previous speakers he almost entirely agreed; all that he wished to do was to bring forward a few facts from his own experience, which had not been very considerable, yet not altogether inconsiderable.

With regard to diagnosis, no doubt there are those who seem to

regard the diagnosis of duodenal ulcer as by no means difficult. His experience was that there were often very serious difficulties, and he should like to refer to one or two of these. They all, of course, knew that the symptoms of duodenal, as of gastric ulcer, are occasionally negative. Sometimes the first announcement of the disease is a severe hæmorrhage or perforation; but a more serious difficulty arises from the fact that sometimes the symptoms of duodenal ulcer are masked by those of some co-existing disease. He recollected a patient who was admitted to the Royal Infirmary with advanced aortic disease, accompanied, as these cases sometimes are, with præcordial pain. The patient one afternoon complained of very severe pain, became collapsed, and died a few hours afterwards. The post-mortem examination showed advanced aortic disease and a perforated duodenal ulcer. The symptoms of duodenal ulcer were entirely masked in that case. Another instance was that of an infant, 9 months old, who showed acute abdominal symptoms. Dr. Affleck was asked by a medical man to see the child just shortly before its death. Post-mortem examination revealed in this young infant a perforated duodenal ulcer—a rare but by no means an unheard-of thing. It was impossible in that case to diagnose duodenal ulcer. These were illustrations of the difficulties one must be prepared for, and showed that the diagnosis was not always such an easy matter.

With regard to the form of the ulcer, whether acute or chronic, he had seen some striking instances of both conditions. He remembered a case brought into the Royal Infirmary where the patient had vomited up a large quantity of blood and was in an extremely collapsed condition. After a day or two, in which the ordinary remedies were employed, she had another attack of vomiting of blood and died. Post-mortem examination showed 24 superficial ulcers—20 in the stomach and 4 in the first part of the duodenum.

With regard to treatment, he did not think that all cases of true duodenal ulcer should be at once handed over to the surgeon, particularly cases of recent occurrence. He had seen several instances of perfect recovery, or, at all events, of good health following medical treatment, where all the symptoms of duodenal ulcer were present. One of these was a case in which the patient was in such a collapsed state from hæmorrhage that when a surgeon was called in he hesitated to do anything at once in order to see if the patient would rally. The patient rallied and rapidly recovered without operation: he is now in perfect health. Cases requiring to be treated surgically he had found to be most satisfactory, but still, if he himself had reasonable evidence that he possessed a duodenal ulcer, he should like to have trial of a little medical treatment before being subjected to a surgical operation.

Mr. H. J. Stiles said that, with regard to the diagnosis of duodenal ulcer, nothing was easier in a typical case, and he thought the profes-

sion owed much to Mr. Moynihan for the very clear clinical picture he had drawn of the condition. At the same time he was free to confess that in a certain proportion of the cases in which he had diagnosed duodenal ulcer the operation showed that the symptoms had been produced by another lesion, and his experience was that similar errors were made by his medical colleagues. Cases of duodenal ulcer do not always give rise to the classical symptoms, while lesions other than duodenal ulcer produce symptoms closely resembling this condition. Perhaps the commonest is where there is a gall-stone which has never given rise to any acute biliary colic, but which has set up secondary pyloric spasm, with pain in the epigastrium and interference with the free emptying of the stomach. He referred to a case of this kind in which a single gall-stone with adhesions between the gall-bladder and duodenum had been diagnosed as duodenal ulcer. The removal of the gall-stone gave only temporary relief to the symptoms, and it was not until after a subsequent gastro-enterostomy had been performed that the patient was completely cured. Only this very morning he had operated on two cases, both of which were diagnosed as duodenal ulcer, the one by himself and the other by his medical colleague. His own case turned out to be a case of cholelithiasis with duodenal adhesions, the other a malignant tumour of the hepatic flexure of the colon. The former patient had a history of hæmatemesis seven years ago and again seven months ago. It was quite possible, of course, that both conditions may have been present, although there was no proof at the operation of an ulcer of the duodenum. Hæmatemesis is not at all uncommon apart altogether from ulcer either in the stomach or duodenum. His experience was that it occasionally occurred in cases of simple atonic dilatation of the stomach, and especially in cases of marked gastropptosis; in these conditions one noted that the veins of the stomach were not infrequently very much engorged.

With regard to what Dr. Gibson had said about the importance of closing the duodenum in addition to performing the gastro-enterostomy, Mr. Stiles said he would like to make his position in this matter quite clear. He wished to state that it had not been his custom to combine closure of the duodenum with gastro-enterostomy in cases in which a duodenal ulcer was present. But what about the cases which were operated on on the supposition that the patient was suffering from duodenal ulcer, but in which instead of an ulcer there was simply a dilated and prolapsed stomach with a wide pyloric canal and a feeble pyloric sphincter? A few years ago he did a gastro-enterostomy in two such cases, and in both the operation was followed by regurgitant vomiting, which necessitated a second operation for the purpose of short-circuiting the jejunal loop. It was this regurgitant vomiting which gave rise to the consensus of opinion amongst surgeons that gastro-enterostomy should on no account be performed unless an ulcer

could be demonstrated. As there was considerable evidence to show that in these cases regurgitation of bile into the stomach probably took place through the pylorus, he determined in his next case of simple dilatation and prolapse of the stomach to close the duodenum as well as perform a gastro-enterostomy. He had now done this on fifteen occasions, and in none of them had there been any regurgitant vomiting, and more or less improvement had followed in every case. He therefore entirely disagreed with the present-day teaching that gastro-enterostomy was contra-indicated except in the presence of an ulcer.

With regard to what Dr. Russell had said about acute duodenal ulcer, he would hesitate somewhat before he definitely diagnosed such a condition. It seemed to him that a duodenal ulcer might exist for some time without giving rise to any symptoms, and then suddenly give rise to trouble. They all knew that ulcers of the duodenum sometimes gave rise to severe hæmorrhage or even perforation without the patient having had any previous symptoms, but he doubted if we had sufficient proof that such ulcers had been acute from the first. He confessed that if he had a patient with severe hæmorrhage from what Dr. Russell would call an acute duodenal ulcer, he would certainly advise medical treatment in the first instance, but he would not take it for granted that the ulcer would be permanently healed by such treatment. He would regard such a patient as being placed in the same position as one who had recovered without operation from a smart attack of appendicitis, that is to say, he would recommend that the patient with the so-called acute duodenal ulcer should not be allowed to run the risk of a second hæmorrhage, or it might be a perforation. He thought the surgeon, however, should, if possible, avoid operating on a patient during or too soon after a severe hæmorrhage, as he had had cases in which he felt sure that the manipulation associated with the operation had aggravated the hæmorrhage.

The results of gastro-enterostomy for duodenal ulcer were exceedingly good. He had communicated with his last forty cases, asking them to reply to a searching series of questions, to see how far the cure had been complete. He was more than gratified with the replies, and he felt sure that this was the universal experience of surgeons. As an illustration of the fact that gastro-enterostomy *per se* had no disadvantages, he might relate the case of an infant on whom eight years ago he did a gastro-enterostomy for congenital pyloric stenosis. The mother had had several children since, and both she and her medical attendant assured him that the child compared favourably, both as regards its physical development and its digestive system, with the other members of the family: indeed, she did not notice any difference whatever.

Lastly, he would like to make a suggestion as regards the etiology



of duodenal ulcer. As they all knew, the chief predisposing cause was the fact that the acid chyme, in being squirted through the pyloric orifice, impinged against the first part of the duodenum, and this was naturally put forward as explaining why hyperacidity and hyperchlorhydria predisposed to duodenal ulcer; but Mr. Stiles wished to point out an anatomical fact which seemed to him to be of importance, namely, that the first part of the duodenum occupied the boundary line between the part of the alimentary canal supplied by the celiac axis and the part supplied by the superior mesenteric artery. Much had been written about the variations in the celiac axis and its branches, but no special attention had been paid to the blood supply of the first part of the duodenum. He thought this was a point well worth investigating, and he would suggest it as a subject for a thesis. If the anastomosis between the celiac and superior mesenteric system of vessels was deficient in the region of the first part of the duodenum, might not the vulnerability of the latter be increased? Or was it the case that the first part of the duodenum was supplied by terminal arteries, and was it the case that the hæmorrhage which occurred from this part of the duodenum was rendered more severe by the fact that it was supplied by very short branches passing directly to it from the gastro-duodenal artery? In very severe hæmorrhage was the gastro-duodenal artery itself involved? All these points were worthy of further investigation.

Dr. G. Lovell Gulland said he agreed with the various speakers who pointed out the extreme difficulty in diagnosis. The hunger pain was often the only symptom which was present to guide one. He would not go into details about the case which Mr. Stiles has referred to: it presented all the features of duodenal ulcer. There was hyperacidity, bleeding, etc., exactly like an ulcer; it did not fit into sarcoma. He had seen two other cases in which there was exactly the same difficulty.

He was accustomed to divide his cases into two groups—those which show hyperchlorhydria and those which do not. Two-thirds show it, one-third do not. Better results were likely to be got from medical treatment in cases with hyperchlorhydria, while the cases which did not show it would undoubtedly go to the surgeon. He supposed they were all agreed that some cases are bound to be operated on, cases with any definite stricture, any real dilatation of the stomach with retention, all cases with continuous hæmorrhage which could not be stopped by medical treatment.

The examination of the fæces is a very important point, because nowadays they possessed reagents of sufficient delicacy to show very small quantities of blood in the fæces. If one had a case showing symptoms of one kind or another and found that it was leaking blood all the time, even although in small quantities, then that case should

be operated on. There are also cases where the patients cannot study their diet, for example, commercial travellers, who cannot follow any prescribed diet; these patients always require operation, while other people in the same class of life, who can get their meals regularly, need not be operated upon. He thought most of the members present would agree with Dr. Affleck in desiring medical treatment. Surgeons spoke of gastro-enterostomy as the simplest possible procedure, but serious and often fatal results follow. He could not agree that recurrences did not take place. He was interested to hear of a case in which Mr. Stiles had performed gastro-enterostomy, in which he declared that there has been no return of the melena. In that case there had been a return of the melena, and the patient could only keep himself right by attention to diet. There is a large percentage of cases in which gastro-enterostomy is performed in which complete recovery does not occur, but probably in nine cases out of ten the operation is most successful.

Mr. Wilkie said he was particularly interested in the etiology of duodenal ulcer and in what Mr. Stiles said with regard to the blood supply of the first part of the duodenum. The blood supply of this part of the duodenum is practically the same as that of the pyloric end of the stomach. This blood is derived from the coeliac axis, and is drained back into the same veins as the supply at the pyloric end of the stomach. He had found that fine solid particles introduced into the right gastro-epiploic vein frequently travelled back into the veins of the first part of the duodenum. This observation was made by injections into the living animal.

In connection with this subject no speaker had mentioned what some authorities regard as important, namely, the connection between appendicitis and duodenal ulcer. Mr. Moynihan believed, and Dr. W. J. Mayo agreed with him, that there was at least some connection between appendicitis and duodenal ulcer; and, lately, Mr. Paterson of London had published a case in which he had proved that a duodenal ulcer directly followed appendicitis. The explanation given was that the toxæmia associated with appendicitis favoured duodenal ulcer. Another explanation was that there might be this retrograde venous embolus from a thrombosed omental vein in cases of duodenal ulcer which followed appendicitis. He had shown experimentally that such an embolus might be very easily diverted into a duodenal or gastric vein, and impacting there might cause a thrombosis, a localised sclerosis, and a gastric ulcer. He had seen a case in which a gastric ulcer apparently followed an attack of appendicitis. The appendix was found healthy, but the omentum was found bound to the abdominal wall over the region of the appendix.

Mr. Alexander Miles said he had several times seen patients with copious hæmatemesis, so severe as to bring the patient almost to

death's door, who without any operation seemed to recover quickly : they remained free from all symptoms for some years, and had no signs either of duodenal or gastric ulcer following. He would like to get the experience of some of the members present who could trace cases of this kind back for many years, and learn if severe hæmorrhages were frequently followed by complete and permanent recovery. He had sometimes in such cases delayed operating on account of the patient's low condition, and had hesitated to perform gastro-enterostomy after the patient had recovered to a certain extent.

Dr. F. D. Boyd said that most of the speakers had been agreed that hyperchlorhydria is closely associated with many of these cases, but as a rule they had some underlying organic condition. What he wanted to recommend to his surgical colleagues was that they should try how far they could influence the hyperchlorhydria by the use of fat. He had had a number of these cases under his care during the last year or two, and had found that one could influence the hyperchlorhydria beneficially if one gave the patient fat before food. One lady he saw the other day, whom he had not seen for more than a year, when he put her on olive oil, returned to say that she was exceedingly well as regards her stomach, but that she could not climb hills, she had got so stout. In these cases if you cure the ulcer as a rule you get rid of the hyperchlorhydria, but in some cases the hyperchlorhydria persists, and he would recommend to his surgical colleagues the use of olive oil or cream before food. By these means the hyperchlorhydria is far better inhibited than by giving belladonna, atropine, &c.; in fact, the pylorus can be relaxed and the duodenal secretion obtained from the stomach by giving olive oil when the organ is empty.

Mr. J. W. Dowden, as bearing on the etiology of duodenal ulcer, mentioned two cases of hair-ball in the stomach which had come under his observation, and suggested that the mechanical effect of a foreign body in the neighbourhood of the pylorus might be considered as a factor in the production of gastric and duodenal ulcer.

Mr. A. A. Scot-Skirving said it seemed to him that a most interesting feature of duodenal ulcer was the absence of any symptoms at all. Of course it was rare to find that. He could understand how a patient suffering from ulcer in the body of the stomach had no pain, or how small ulcers in the duodenum might exist without any symptoms, but when a patient has no symptoms until the time of the rupture, and on cutting down an ulcer almost as large as a watch is found, then it became a matter of very great interest to find out how this patient developed his ulcer and had it for a long time without any symptoms. The patient he referred to had now got over the operation, and when he was well enough to have his history gone thoroughly into, it was elicited that occasionally at work he had had a little feeling of nausea,

but he could eat dishes of potatoes without pain, and had never vomited in his life until five or six minutes after his ulcer ruptured.

Further, why is it that while operating for stricture of the pylorus, due to duodenal ulcer there, dilatation of the first and second parts of the duodenum is found? Was it comparable to the dilatation at the rectum in cases of intestinal obstruction a little higher up?

The President said they must congratulate Mr. Caird on the success of the discussion, which had been a very valuable and practical one. He (the President) had been struck with the very large number of cases of duodenal ulcer which some of the speakers seemed to have met with; it had been talked of as occurring in hundreds of cases. Personally he had found it, comparatively speaking, a rare condition. Professor Alexis Thomson had brought forward only some fifty cases seen in his hospital practice during the last five years, and Mr. Stiles had brought forward forty cases in four years. These two eminent surgeons had only some one hundred cases between them. Duodenal ulcer seen post-mortem and seen at operation is very much less frequent and common than perhaps some of them had gathered from this discussion. Of course, as had been well said, many cases are diagnosed as duodenal ulcer where no ulcer exists; that perhaps is the explanation.

With regard to diagnosis, he laid special stress on the sex factor. He always hesitated to diagnose a duodenal ulcer in a woman. It required, he thought, much more definite evidence in a woman than in a man. Cold, he had found, made these cases of duodenal ulcer materially worse. One symptom had not been mentioned, namely, jaundice; he had seen it in a few cases which had been proved by post-mortem examination to be cases of duodenal ulcer.

One question raised by Dr. Russell was, in his opinion, of great practical importance, namely, the occurrence of hæmorrhage from superficial erosions. The surgeon sometimes fails to find any lesion in the stomach in cases in which there had been a profuse hæmorrhage a few days before the operation. He had seen several cases in which no lesion was found post-mortem where the patient died soon after a hæmorrhage. It is said, of course, that in these cases the hæmorrhage occurs without any ulceration. At a discussion which took place in Liverpool last June he asked Dr. Hale White if he knew of any means of differentiating cases in which hæmorrhage was due to ulceration and those in which there was no ulceration. Dr. Hale said he knew of no means. He thought the explanation was the one which Dr. Russell perhaps meant to suggest, and which he (the President) had suggested to Mr. Stiles a few days ago, namely, that a superficial ulceration of the stomach which has caused a large hæmorrhage may heal in a few days, and may have disappeared when the patient comes to be operated on or examined post-mortem.

With regard to the question of operation in duodenal ulcer, his



own feeling was that it was as well to give the patient the benefit of medical treatment in a first attack: but if he himself had a duodenal ulcer, and if it did not very rapidly heal under diet and medicinal treatment, he would certainly like to be operated on. He had been so impressed with the number of cases in which a fatal result had followed, either from hæmorrhage or perforation, that he had come to the conclusion that duodenal ulcer was a much more dangerous condition than gastric ulcer.

Professor Caird in replying thanked the Society for the way in which they had received his paper. It was perfectly evident, taking it all round, that amongst the speakers there is unanimity of feeling in regard to the correctness of Mr. Moynihan's remarks on duodenal ulcer. No doubt there were difficulties in diagnosis, and therefore it was a great help to have the picture which Mr. Moynihan had figured to go on, however correct or incorrect it might be.

With regard to the question of acidity, the majority of them apparently held the opinion that hyperacidity was frequently characteristic of duodenal ulcer.

As to medical treatment, there was no reason why it should not be carried out; it was a curative agent.

He was much interested in Dr. Gulland's views as to the cases which required operative interference, as also in his remarks about occult hæmorrhage. He (Mr. Caird) had no doubt that the demonstration of occult hæmorrhage would aid greatly in diagnosis.

With regard to surgical treatment, so far as he could gather, closure of the pylorus or inversion of the ulcer was not employed by anyone present as an addition to gastro-jejunostomy in cases of duodenal ulcer.

With regard to the state of the patient after a gastro-enterostomy for duodenal ulcer, he agreed with Mr. Stiles that the results of operation are brilliant. He could not recollect a single instance where a gastro-enterostomy practised for a distinct duodenal ulcer was followed by return of symptoms. In regard to the results of gastro-jejunostomy for conditions other than duodenal ulcer, he could not go beyond the limits of the present discussion, and so would not take up the questions involved in the treatment of the neurasthenic patients mentioned by Mr. Stiles.

Dr. Dewar spoke of the hereditary nature of the condition. Reliable information on that point was lacking, but he had operated on two brothers in the same family. He could not give any opinion with regard to the urea or to micturition.

Dr. Gibson referred to the spasm. He (Mr. Caird) thought there was good reason for believing that there was a reflex spasm. As to the hypertrophy, they were not always certain when the pylorus was hypertrophied.

Mr. Cathcart mentioned the relatively high fatality of perforated duodenal ulcer. From the statistics it was difficult to say that the mortality was higher than in perforated gastric ulcer : it was a question very largely of individual cases.

Dr. Wilkie had drawn attention to the relations between appendicitis and duodenal ulcer. At present he (Mr. Caird) only remembered one instance where a patient suffered from duodenal ulcer who had undergone an operation about a year or eighteen months previously for appendicitis. It was curious that appendicitis should be so common and gastric and duodenal ulcer so relatively rare if there be a connection between these conditions.

Mr. Scot-Skirving's question as to why the duodenum is dilated in some cases of stenosis he was not prepared to answer.

As regards the President's remarks with regard to hæmorrhages which occur from mucous surfaces and are not found on post-mortem examination, he could recall a case of that kind which had proved fatal and showed no gross lesion after death.

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Skintgram showing calculus at lower end of each ureter. (Dr. Hope Fowler.)



**CLINICAL RECORDS.****IMPACTION OF CALCULUS AT THE VESICAL END  
OF EACH URETER.**

By ALEXIS THOMSON, F.R.C.S.

THE patient, a miner, aged 29, was admitted to Ward 13, Royal Infirmary, on the 4th September 1910, on the recommendation of Dr. Primmer of Cowdenbeath.

He had always been healthy until four years ago, when, while at work in the pit, he was seized with a severe pain in the right side, and was obliged to lie down. The attack lasted for an hour and a half, and passed away as suddenly as it came. While the pain lasted there was marked inclination to micturate, but he was unable to do so; after the attack he passed a large quantity of urine, which he avers had the colour of port wine.

For the next six months he was able to work, but was scarcely ever quite free from a gnawing pain in the right side. He then had another severe attack of renal colic. On this occasion it commenced below the costal margin in front on the right side, and passed down into the testicle. The attack lasted about eight hours, and at about hourly intervals there were exacerbations of pain which caused him to writhe in bed.

For two years he was practically free from pain, but in November 1909 he had another severe attack, lasting off and on for two days, and requiring injections of morphia. Since then he has been obliged to give up his work on account of severe pain in the line of the ureter. Of late the attacks have become more frequent, almost every second day, and he now suffers from pain at the meatus externus at the end of the act of micturition.

On admission he was found to be a stout, healthy-looking man; nothing could be made out on abdominal or rectal examination. The urine was of high specific gravity and contained crystals of oxalate of lime, but no blood. A skiagram taken by Dr. Hope Fowler showed two small shadows symmetrically placed at the level of the floor of the bladder (Fig. 1).

On the 25th of October 1910 the bladder was opened by Kocher's incision, with division of the recti, and an extra large opening was made into the bladder. The gloved finger then easily felt a stone impacted in the lower end of each ureter, and apparently covered only by the mucous membrane of the bladder. The mucosa was incised over each, but the irregularities on the surface of the stone and the

tightness with which it was grasped by the ureter made removal difficult. I was glad to have the assistance of Mr. George Chiene. The convalescence was uneventful, and the patient is now back at work. Subsequent inquiries elicited the fact that he had had pain on the left side.

The history in this case was very misleading, and had it not been for the skiagram we would have known nothing of the stone in the left ureter until we opened the bladder. The most remarkable feature in the case was the extent to which the lumen of both ureters was obliterated without any apparent interference with the renal functions. The alternative explanations suggested were either that he had double ureters, and of this there was no evidence, or that the spasm was completely relaxed between the attacks of colic.

#### EPITHELIOMA OF THE UPPER END OF THE OESOPHAGUS. PARTIAL OESOPHAGECTOMY. RECOVERY.

By DAVID WALLACE, CMG., F.R.C.S.

MALIGNANT tumours of the oesophagus are so seldom capable of excision, with a prospect of even immediate success, that the following case seems worthy of record:—

Mrs. B., æt. 37, was admitted into the Royal Infirmary on 11th November 1910 complaining of pain and difficulty in swallowing. *History*.—Eight months ago a fish bone seemed to stick in her throat, where it apparently remained for three days, giving rise to slight discomfort. Since that time she has felt irritation in the throat, particularly when swallowing anything hard, but she has not had much pain. Swallowing has gradually become slightly more difficult, but she can still swallow soft solids. She has not seen blood at any time and has not lost weight. She is a healthy-looking woman and is nursing her youngest child aged 4 months.

The history and symptoms were so indefinite that, although the presence of a stricture of the oesophagus was thought of, it was considered unlikely to be the explanation of her condition. Bougies were passed and a constriction at the level of the cricoid was detected. There was no external swelling and no glands were palpable. On 15th November oesophagoscopy showed the surface of the constricted area to be nodular and grey in colour, just the appearance expected in an epithelial ulcer. On 18th November Dr. Logan Turner examined the patient and removed a portion of the tumour, which, on microscopic examination, proved to be a squamous epithelioma. On 20th November operation of partial oesophagectomy. An incision on the left side of the neck, from the level of the hyoid down nearly to the manubrium sterni, was used and the oesophagus exposed in the usual

way. The left lobe of the thyroid was enlarged, and interfered with the exposure of the œsophagus, and it was therefore removed. The lower limit of the tumour was defined, and an opening into the œsophagus below that point enabled a good view of the growth to be obtained. The œsophagus was divided transversely below it and then the upper portion with the tumour was dissected from the larynx and removed as a whole. The differentiation of the tumour from the pharyngeal tissues was not so easy as the recognition of its lower limits, but the diseased tissue was removed as thoroughly as possible. The upper end of the œsophagus was stitched to the muscles and skin at the lower end of the wound and a rubber stomach tube introduced. The gap at the upper end of the wound was lightly packed with iodoform worsted and the margins approximated by two or three sutures.

The patient made an uninterrupted recovery and left hospital on 17th December, nineteen days after operation.

*Microscopic Report of Parts Removed*:—(1) Tumour; a squamous epithelioma. (2) Thyroid lobe normal. (3) Lymphatic gland not infiltrated.

*Remarks*.—This patient was sent to hospital as probably a case of hysteria, and the symptoms were so slight that diagnosis was impossible until an œsophageal bougie was attempted to be passed. In this as in some other cases the acorn-shaped bougie could not be introduced, while a cylindrical gum elastic instrument of the same calibre went in easily. This the writer has observed before, and he believes that while the former enables one to locate and estimate the length of strictures, for diagnosis and dilatation the latter is more serviceable.

Partial œsophagectomy has not been a successful procedure, even in the few cases where it was considered a justifiable operation. Death has resulted within a few days in most, and recurrence of the disease, and death within a short time, in the others. The writer is of opinion that one of the chief essentials to success in partial excision is, as in œsophagostomy, to leave a freely open wound and avoid all tension.

The patient, 15th February 1911, is in excellent health, and there is no sign of local recurrence.

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## A CASE OF PULMONARY TUBERCULOSIS WITH WHOLE LUNG AS ONE CAVITY.<sup>1</sup>

By W. E. FOGGIE, M.A., M.D.,

Physician for Diseases of the Skin, Dundee Royal Infirmary.

THIS case concerns a woman of 25 who came under observation on account of chest disease of eighteen months' duration. There had been

<sup>1</sup> Read before the Forfarshire Medical Association.

cough and spit, hæmoptysis of some severity on several occasions, and also increasing dyspnoea. She was pale and cyanosed, and easily tired on any exertion.

The chest was small and flat, with diminished movement on the right side. There was a tympanitic note over the front of the right side from the apex to the fourth rib, and also behind, from the apex to the middle of the interscapular region. On auscultation a peculiar echoing amphoric breathing was got over the right side as far down as the third space in front, and, behind, this type of breathing was heard as far as the middle of the interscapular region. This area with the tympanitic resonance gave a characteristic anvil sound with the coin test, and its limits as mapped out by the method of combined percussion and auscultation coincided with the areas over which the echoing breathing was heard. There was occasionally a tinkling bell sound over the same area. Vocal fremitus and vocal resonance seemed diminished. Over the rest of the right lung there was bronchial breathing, with numerous medium crepitations. There was less evidence of change over the left lung, except at the base. Tubercle bacilli were present in tolerably large numbers.

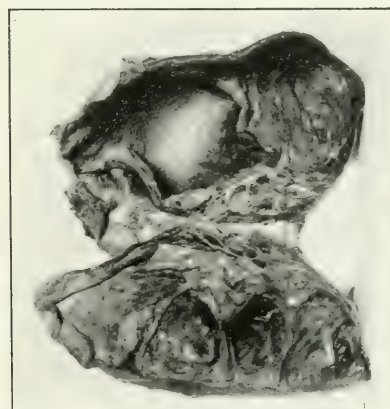
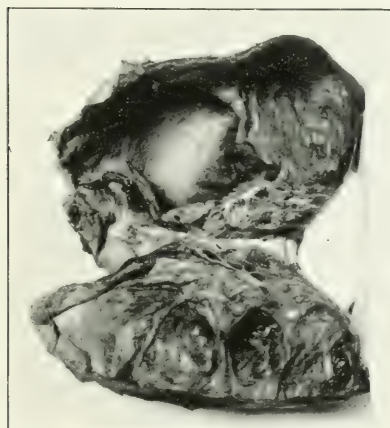
An X-ray photograph taken at this date showed over the upper chest on the right side a large clear area, which reached as far as the third intercostal space. Below this there was a very dense part. The left lung showed some mottling.

There was nothing particular to note in the other systems. The pulse was quickened and the heart was in its normal position. The appetite was fair. There was no diarrhoea. The liver and spleen were normal in size. At this time the condition seemed to warrant a diagnosis of phthisis, with the presence of a large air-cavity (probably a pneumothorax) occupying the upper half of the right chest, consolidation of the lower half of the right lung with thickened pleura over it, and some left-sided basal disease.

During the next year or two the condition of the patient's lungs gradually became worse, so that at death (two and a half years after first coming under observation) there was widespread cavitation at the right base and advanced disease of the left lung, with probable cavitation at both apex and base.

There were also many of the usual accompaniments of a long-standing phthisis, such as a pyrexia of varying type, a gradual increasing weakness, and other evidences of systemic involvement. Just about coincident with the failure of the digestion during the last six months of the patient's life waxy enlargement of the liver and spleen set in. At the same time a well-marked polyuria (80-100 ozs.) with albumen in increasing amount showed in like manner the same changes in the kidneys. A diarrhoea from similar changes in the bowels and an acute nephritis, with a superadded tubercular laryngitis brought about the fatal issue after an illness lasting four years in all.





Stereoscopic photograph of right lung in section to show the extent and nature of the cavitation.



The diagnosis made was as follows:—Pneumothorax, upper right lung with numerous cavities in the lower half, along with widespread pleural adhesion; extensive tubercle of left lung with probable cavities at apex and base; general amyloid disease; and tubercular laryngitis.

The post-mortem examination showed widespread waxy disease of the liver (weight, 7 lbs. 2 ozs.), spleen (weight, 12 ozs.), kidneys (6 ozs. each), and also waxy changes in the intestinal wall. There was also tubercular disease of the larynx, with the presence of two shallow ulcers on the laryngeal surface of the epiglottis.

The right lung was densely adherent to the chest wall, with especial thickening of the pleura at the apex, over the anterior surface of the lung, and over the diaphragmatic surface. The right lung was really a bag with thickened pleura as its wall. In front the cavity stretched without a break from the apex to the base, but posteriorly, at the junction of the middle and lower thirds, a marked projecting ridge gave the lower part of the cavity the appearance of a second cavity below and behind the larger anterior one. Both, however, were in free communication. The wall of this cavity of the whole lung was smooth anteriorly, rough and ragged posteriorly. There were some trabeculae stretching across the posterior wall. There was purulent material in small amount in the cavity. A small wedge of compressed-looking lung was present at the posterior part of the base of the lung. The left lung showed a smooth-walled cavity the size of a hazel-nut about  $\frac{1}{4}$ -inch below the surface. The lower lobe showed extensive tubercular consolidation, but no large cavity.

The case presents for consideration two points—(1) the mistaken diagnosis of a pneumothorax, and (2) the occurrence of cavitation of such a size.

1. The mistake of diagnosing such a large cavity as a pneumothorax is quite a possible one. The points in the above case that were considered in favour of a pneumothorax were—the tinkling sound, and the marked anvil sound, whilst the absence of the displacement of the heart, which such a large pneumothorax should cause, was explained by the large amount of basal disease with accompanying pleural adhesion. That this is no special pleading is shown by the statement of Fowler (*Diseases of the Lungs*, Fowler and Godlee, p. 639), where he says: “When the lung is completely excavated so that nothing but the pleural capsule remains, the condition closely simulates a pneumothorax. Amphoric breathing, metallic tinkling, and the bell sound may be present; the two former signs are common, the latter is rare; but we have carefully noted its occurrence.” Laennec is quoted by Stokes (*Diseases of the Chest*, N. Syd. Soc., pp. 438 and 439) in regard to two cases of phthisical cavities producing metallic phenomena, and Stokes himself had noted the same condition.

The case here described showed all these phenomena, the bell

sound being especially well marked. In a certain sense the physical condition in pneumothorax and in huge cavitation so approximate as to give naturally the same clinical results.

2. *The huge cavitation* of the lungs is a well recognised but not common occurrence, and has been especially referred to by the older writers. Louis (*Researches on Phthisis*, Syd. Soc., p. 38) mentions a case with "an enormous cavity occupying three-fourths or four-fifths of the entire mass of the lung, extending from the apex to within nearly an inch of the base, and from the posterior border to within about five lines of the anterior." Even more appositely Stokes (*op. cit.*, p. 439) found in a case the left lung universally adherent and so excavated as to resemble a bag of liquid more than a lung. Ewart (article "Vomica," in *Quain's Dictionary*, 1891) says the cavities may involve the whole of one lung. Of more recent date West (*Diseases of Organs of Respiration*, 1909, vol. ii. pp. 521-523) discusses in detail these cases of large cavitation, which, he considers, form an interesting and remarkable clinical group, and therefore deserve special description when speaking of the forms of phthisis. Of his twenty-five cases there was in none less than one whole lobe involved. In many the cavitation extended beyond one lobe, but in only two was the whole lung excavated. Clinically, he finds these cases run a chronic course, and are marked by recurrent hæmoptysis. He only gives details regarding the two cases of complete excavation which he considers very rare.

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## MEETINGS OF SOCIETIES.

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### Forfarshire Medical Association.

A MEETING of this Society was held on the evening of Thursday, 2nd March, in the School of Medicine, Dundee, Professor Kynoch in the chair.

Mr. Greig showed a hydrocephalic boy, aged 8 years, who presented some mental deficiency, and along with this a somewhat symmetrical curving of each index finger towards the radial side. He had also an unusual deformity of one hallux, the phalanges being displaced backwards on to the plantar aspect of the foot. Radiograms of this were shown to demonstrate that the possible origin had been a dichotomy with ill-developed outer segment. He also showed the photograph of a woman, aged 84, the subject of multiple tumours on the face and sternum (leontiasis ossea), which had become sarcomatous during the last few months. A plaster cast, taken post-mortem to show the full extent of the disease, was also exhibited. Mr. Greig then showed a plaster cast of an old-standing dislocation at the wrist, which had happened in childhood, of a woman now aged



52, and demonstrated radiograms to show the displacement of the wrist and the alteration in the bones of the forearm.

Mr. Price showed the specimen of a large tumour removed from the buttock of a woman aged 38, which had existed for ten years without giving rise to any symptoms apart from growing discomfort, owing to its increase in size. Examination proved the tumour to be an angio-sarcoma, the remarkable feature of the case being the slow growth of the tumour. Twelve months had elapsed since removal, and there had been no recurrence. He also showed a tumour of eight years' growth removed along with the testicle from a man 50 years of age, which was found to be a round-celled sarcoma. Microscopic specimens of both tumours were exhibited.

Dr. J. A. Lowson of Forfar read a paper on "Plague Prospects at Home and Abroad." He said that interest in plague at present had been revived by the Manchurian epidemic and the state of affairs in Suffolk and adjacent counties. The Manchurian situation might be overdone. It was a region where the missionaries had the field almost to themselves, and, however brave a man might be, an epidemic of pneumonic plague was usually an appalling matter to newcomers, where the moral support of men standing alongside was of inestimable value. Scattered missionaries with feeble financial resources were hardly capable of seriously dealing with a desperate plague situation. The mortality there, however, has been no greater at least than in India and South China. In Canton in 1894, before he visited the city, the months of February, March, and April had seen a mortality of over 120,000 from plague alone. This was the number of coffins which had been sold by the coffin guilds in excess of the ordinary demand. The state of the hospitals and burying-grounds almost defied description. In May 1894 in Hong-Kong the Taiping-shan district supplied a mortality which outsiders could hardly believe. Over a few acres of ground every house supplied from three to twenty cases, and the true mortality at that time will never be known owing to the panic and plague measures driving inhabitants to flee to Canton. Again, at Cutch Mandri in India in 1897 the mortality was serious. Of 40,000 inhabitants within the walls, only 12,000 were there when he visited it. The other 28,000 were camped out or were dead. The first night's count of dead bodies leaving the gates showed that over 150 of the 12,000 had perished—a rate which would have wiped out the town in two and a half months. The state of the district was very serious, the inhabitants having literally as well as metaphorically burnt their boats, hardly a stick of wood being left to burn up the dead bodies.

He was somewhat glad that the type of plague was pneumonic in Manchuria. There was a growing tendency amongst home experts to neglect the man-to-man side of infection. Great harm might be

done by men who only knew of one type of the disease. Plague almost seemed like influenza in the multiplicity of its forms. The Black Death in 1348 was essentially pneumonic and hæmorrhagic, whereas the 1665 disease seemed more bubonic, and also abdominal in type, dysenteric stools being a frequent symptom. The distinction between bubonic and pneumonic plague was to be deplored. A bubonic case might become septicæmic in a few hours and pneumonic in a few hours more, all depending on the virulence of the infection. When virulence lessens, then man-to-man infection lessens correspondingly. He referred to an article by "P. H." in the February *Contemporary Review*. It was evidently an *apologia* for the Local Government Board, and made the tackling of plague as easy as shelling peas. He had little doubt "P. H." would get a rude awakening some day. His talk about the rarity of multiple cases in houses in Sydney indicating small danger of personal infection could be met with thousands of instances of the reverse. In one paragraph he says: "The fact that during the past few years so few cases of human plague had occurred in Suffolk, notwithstanding the absence until recently of any special precautionary measures, illustrates very strikingly the small degree of risk of spread of the disease in this country." Quite apart from the surrounding exceptional circumstances here, one could only say this: In 1664 there were only five recorded cases of plague in London, yet in 1665 there were 70,000 deaths from plague. The danger in England is the disease getting a start in a pneumonic form in the slums of a large city; a good virulent strain and the fire begins. Dr. Louis Sambon had lately written a letter in the *Times*, and he (the speaker) quoted as follows from it:—"Basing myself on the history of numerous epidemics, on well-ascertained facts in the epidemiology of plague and on analogies supplied by other diseases, etc., I hold that in epidemic plague transmission from man to man is probably more frequent than transmission from rat to man." With that he thoroughly agreed; it had certainly been his experience.

He then went on to treat of animal infection. After detailing interesting mistakes which had been made by various bacteriologists, he expressed the hope that someone would work out the relationship of the hæmorrhagic septicæmias which had a bacillus somewhat similar to that of pest. He gave instances of the occurrence of epidemics in pigs, cattle, and fowls in recent years where it was a coincidence that plague was not far away and yet the first-mentioned epidemics were typical hog cholera, the cattle septicæmia (discovered by Hunter of Hong-Kong), and fowl cholera. The bacilli of these diseases may all have had a common grandfather, and some divergence from the type might modify them for working evil on different families of nature.

After touching on seasonal prevalence, infection of cats and dogs, and the great rat question, he desired to make a few suggestions. After seeing a great amount of plague he had come to the conclusion that this over-educated country was excessively ignorant about this disease. The *Times* special plague correspondent on 22nd December last declared he was sure that there were not twelve men in England at present who knew what epidemic plague really meant. That is perhaps not very wide of the mark, and the sooner the public generally is instructed the better it will be off should matters become worse. The Local Government Board might have all its plans perfect for dealing with plague, but they would be baffled by the ignorance of the inhabitants, just as has happened all over the world since the disease was discovered. If he had to deal with this question he would first ask the Chancellor of the Exchequer for £100,000. Then he would ask Sir Conan Doyle to write a booklet on plague, pointing out dangers, precautions to take, and what to do generally to keep matters right. This should be distributed broadcast over dangerous zones, and the issue of useless blue-books curtailed. In addition, in the areas of the rat plague the question should be brought home to the people by the business-like methods of Canada, viz. by popular lectures, the cinematograph films, and the lantern slide. Instruction of the most valuable kind connected with rat and man disease can most easily be spread by such means. He also advocated Government control of vaccine preparation and experimentation to improve its methods of preparation and use.

A number of interesting lantern slides were shown.

Professor Stalker, in thanking Dr. Lowson for his paper, said, as an Association we were fortunate in having received first-hand information from Dr. Lowson on such a subject as plague, in a paper which contained a touch of advice mixed with adventure.

Dr. Mackie Whyte said that after having heard Dr. Lowson's remarks on the subject he hoped we would be in a better position to combat an epidemic of plague should it visit us than we were in the first influenza epidemic many years ago.

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## RECENT LITERATURE.

## CRITICAL SUMMARIES AND ABSTRACTS.

## MEDICINE.

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## RECENT GASTRIC TESTS.

*Simple Examination for HCl.*—Owing to the fact that some nervous patients object strongly to the use of the stomach tube for obtaining gastric juice which may serve for the estimation of hydrochloric acid and other contents of the stomach, various simple methods have been devised to test the functional activity of the juice and to obviate the use of the tube. Such, for example, are Meunier's catgut-fastened capsule containing ether, which gives a characteristic eructation on escaping into the stomach; similar capsules containing methylene blue that stains the urine, &c. An extremely simple test has been practised by Fuld,<sup>1</sup> who gives the patient a test-meal, and one hour thereafter a draught of water containing soda. If hydrochloric acid be present one hears, on auscultation over the stomach, the gurgle of swallowing, followed a few seconds later by the crackle of effervescing bubbles as the soda and acid come into contact.

*Temperature of the Stomach.*—Riehl,<sup>2</sup> acting upon the frequent clinical practice of applying cold or hot applications to the outside of the abdomen for the relief of various pathological conditions of the internal organs, made an investigation to determine whether the temperature is actually influenced at a depth by such superficial changes. Naturally the point is one of considerable importance, for it can be readily understood that a diminution, even very slight, in amount of the temperature in the interior of the stomach might have an important influence in diminishing congestion of the mucous membrane, and so lessening the danger or checking the quantity of a hæmorrhage from the gastric mucous membrane. He examined ten cases of persons accustomed to and tolerant of the passage of a stomach tube, and introduced into their stomach a thermometer with the bulb projecting from the eye of a soft rubber tube. By this means the temperature was taken before and after the application of an ice bag to the abdomen, and as a control the rectal temperature was also observed. The difference he found to amount in every case to an appreciable fraction of a degree, and in one case to as much as 1.8° C. It seems to us that the observation requires to be confirmed, and might profitably be repeated with more delicate instruments.



*Comparison of Salomon's and Hæmolysin Tests.*—Fraenkel<sup>3</sup> instituted an interesting comparison to discover the relative merits of Salomon's test and the hæmolysin test as regards early diagnosis in cancer of the stomach. The former, as is well known, is a procedure introduced by Salomon<sup>4</sup> in 1908, and consists in the examination of the wash-water from the fasting stomach for albumin and amount of nitrogen. The stomach suspected to be the seat of carcinoma is washed out at night and again in the morning with normal saline solution, and from the latter washings a portion is taken and tested for the presence of albumin by Esbach's tube, while the total nitrogen is also estimated by Kjeldahl's method in another portion. An amount of albumin over  $\frac{1}{10}$  per thousand and of nitrogen exceeding 20 mgrms. is supposed to indicate strongly the presence of carcinoma. In practically all cases of gastric carcinoma there are set free in the stomach, as pointed out by Grafe and Röhmer, various bodies of a lipoid nature possessed of a hæmolytic action. It is to be observed, however, that other conditions such as simple ulcer of the stomach and gastroptosis or gastrectasis, in which trypsin may find its way into the organ, also give rise to a gastric juice capable of causing hæmolysis. Therefore there is an initial possibility of fallacy in trusting too entirely to the hæmolytic test. This test is performed by Grafe and Röhmer<sup>5</sup> as follows:—The stomach is washed out in the evening, and next morning an Ewald's test breakfast is administered and withdrawn after three-quarters of an hour. The fluid is rendered slightly alkaline and then shaken up with an equal quantity of ether for 12 hours. The ether extract is next decanted off, the ether is evaporated, and the residue rubbed up with normal salt solution. The resulting emulsion is added in decreasing quantities to tubes containing 1 c.cm. of a 5 per cent. suspension of carefully washed fresh rabbit's blood corpuscles. These are filled up to 3 c.cm. with normal salt solution and placed in the incubator (37°) for 3 hours and then over night in the refrigerator. If complete hæmolysis of the corpuscles takes place the result is regarded as positive. These writers found in one series of 38 proved gastric carcinomata that hæmolysis was always positive. In 24 cases of simple ulcer of the stomach, however, they discovered that six serious ulcers gave a positive, though weak, hæmolysis.

Other writers have discussed the value of the hæmolysin test after more or less extended trial. For example Sisto and Jona,<sup>6</sup> as the result of examining thirty patients, came to the definite conclusion that in all cases where a diagnosis of gastric cancer was established the test gave a positive result, while in all others it was negative. This sweepingly favourable view goes beyond the claims of the originators for the value of the test, and is strongly in opposition to the experience of Livierato.<sup>7</sup> This writer modified the test so far as to use an alcoholic, a watery, and an ethereal extract of the stomach contents, and he also used

various kinds of blood corpuscles for indicator. He found, however, that while cases of gastric cancer yielded a hæmolytic substance in only 65 per cent., a moderate hæmolysis was produced by fluid from the normal mucous membrane in as many as 48 per cent. of cases. He therefore concludes that the test is not of much value, but his results were probably due to the fact that he took into account slight degrees of hæmolysis, which other writers did not.

Fraenkel found the hæmolysin test positive in 15 out of 21 certain cases of carcinoma, or 73·4 per cent., but it was also present in 8 out of 18 cases, or 44·4 per cent. (compare the similar figure of Livierato), that were proved not to have a carcinoma. The Salomon test, on the other hand, was present only in 13 of the 21 cases, or 62 per cent., and in 1 of the 18 cases, or 5·5 per cent. Therefore it may be said that according to this writer the Salomon test is less delicate, but at the same time less liable to positive fallacy, than the hæmolysin test. Somewhat similar results were reached by Rose,<sup>8</sup> who regards both tests as of considerable value, and we may conclude that in doubtful cases of carcinoma where it is important to come to a definite decision for the purpose of operation they form useful additions to our diagnostic armamentarium, though they must not be viewed in the light of being infallible in either direction.

*Tryptophan Test for Carcinoma.*—Neubauer and Fischer<sup>9</sup> in 1909 introduced the tryptophan test for the diagnosis of gastric carcinoma, and since then it has been subjected to considerable criticism and review, notably of late by Oppenheimer. The test depends upon the fact that the surface of a breaking-down carcinoma secretes ferments capable of splitting up proteids. Certain complicated derivatives of albumin, known as peptids, can be so split up by the cancer ferments while they are not affected by the pepsin and hydrochloric acid of the gastric juice. Further, peptids can be combined with an amino-acid which will not in combination give its characteristic reaction, although after the peptid-splitting ferment has been allowed to act the amino-acid is set free and may be tested for in the stomach contents by the addition of bromine water. The particular substance used by Neubauer and Fischer was glycyltryptophan, a crystalline body. The method of the test is as follows:—The patient takes a test-meal which at the end of half to three-quarters of an hour is removed and subjected to preliminary tests. In the first place it is examined for blood, the presence of which vitiates the test, also for bile-pigment, in order to exclude the presence of regurgitated pancreatic juice which also forms a fallacy; it is then tested with bromine water to see if any amino-acid may be present naturally. If these precautions give a negative result the contents are filtered, 10 c.cm. of the filtrate is taken, mixed with a little glycyltryptophan, and put in the incubator for 24 hours. A little of this is then acidulated with acetic acid and tested with

bromine water, a red colour indicating the presence of free tryptophan and indirectly, therefore, the existence of a special ferment (cancerous) in the gastric juice which has effected the splitting of the glycytryptophan. The authors of the test admit four important fallacies, viz. the presence of amino-acid, of peptid-splitting bacteria, of trypsin, and of blood. Oppenheimer<sup>10</sup> investigated the test recently in 40 cases. Of these, 24 known to be suffering from other diseases gave the test negative, 9 cases of gastric carcinoma were positive, and 6 of supposed and mistaken carcinoma were negative. In 3 cases the test was wrong; in one of these a repeatedly positive test led to an operation, when gummata of the liver were found; in another the test was sometimes positive, sometimes negative; while in a third case of undoubted carcinoma the test gave a negative result. Weinstein<sup>11</sup> gives a very favourable judgment upon this tryptophan test as a result of examining some 63 cases. In 19 of these the test gave a positive result. Of these, 15 cases were subsequently proved to be suffering from gastric cancer, two were doubtful though probable cases of this disease, while two were merely cases of simple ulcer. In these two last cases blood may possibly have been a fallacy. The rest of the 63 cases, some of which had other stomach conditions and some general diseases, gave a negative reaction. Like the other two tests discussed above, the tryptophan test may therefore prove valuable in cases where there is little to go upon in making a diagnosis, but one must not trust to it entirely.

REFERENCES. <sup>1</sup> Fuhl, *Berl. klin. Wochenschr.*, No. 44, 1910. <sup>2</sup> Riehl, *Muench. med. Wochenschr.*, No. 52, 1910. <sup>3</sup> Fraenkel, *Med. Klinik*, No. 28, 1910. <sup>4</sup> Salomon, *Muench. med. Wochenschr.*, No. 14, 1908. <sup>5</sup> Grafe u. Röhmer, *Deut. Archiv. f. klin. Med.*, Bd. xciii. xciv. and xevi. <sup>6</sup> Sisto u. Jona, *La Clin. Med.*, 1909, 5. <sup>7</sup> Livierato, *Berl. klin. Wochenschr.*, No. 51, 1910. <sup>8</sup> Rose, *Deut. Archiv. f. klin. Med.*, Bd. xc. <sup>9</sup> Neubauer u. Fischer, *Ibid.*, Bd. xcvi. <sup>10</sup> Oppenheimer, *Ibid.*, Bd. ci. <sup>11</sup> Weinstein, *Journ. of Amer. Med. Assoc.*, 24th September 1910.

## SURGERY.

### THE TREATMENT OF SYPHILIS BY "SALVARSAN."

THAT "salvarsan" is now being widely used in the treatment of syphilis is evidenced by the numerous reports which come from all quarters. The unqualified praise accorded to this remedy in the earlier reports has been to some extent modified by the later records, which tell of occasional lack of success and even of harmful effects following its use. On the whole, however, investigators agree that in "606" we now possess a very potent remedy which will effect a rapid disappearance of the majority of syphilitic lesions, which

often succeeds best in those cases that have for long resisted treatment by mercury and iodides, and the administration of which, in capable hands, is practically free from serious risk.

The ideal of a "*therapia sterilisans magna*" is best attained when a full dose of the drug is given intravenously, and many writers endorse Ehrlich's original plan of following this up by an intramuscular injection to establish a "depot" from which absorption may gradually take place. Other observers give but the one dose intravenously.

Numerous cases of local sloughing and abscess formation following intra-muscular injections are on record, and such lesions are peculiarly resistant to treatment. Most writers agree that the striking train of symptoms—rigors, high temperature, headache, and vomiting—which frequently follow an injection of the drug is due to the liberation of the endotoxin of the vanquished spirochetes, and that much of the subsequent local improvement and general well-being is accounted for by the consequent formation of antitoxin. Thus the blood serum from patients treated with "606" has been frequently injected into syphilitic infants with remarkable success, and likewise the milk from a syphilitic mother treated with this drug, although it contains only the minutest traces of arsenic, is curative for her syphilitic infant.

All writers agree that the most brilliant results are obtained in cases of tertiary syphilis, and failures have for the most part been in cases in the primary or early secondary stages of the disease. The efficacy of this remedy in parasyphilitic lesions is still questionable, for although numerous cases of *tabes dorsalis*, greatly benefited by "606" injections, have been recorded, many writers record series of such cases which failed to show any improvement after one or more injections.

So far no case of ocular trouble, such as so frequently follows the use of atoxyl, has been recorded, and, contrary to the earlier reports, considerable success has been attained in the treatment of syphilitic affections of the eye.

Gaucher and Hallopeau in communications before the French Academy of Medicine both offered the most adverse criticism to the curative effects of salvarsan. They instanced numerous cases of recurrence of the syphilitic lesions after what is generally considered adequate treatment, and they advocated the use of *hectine* in preference to that of "606" in the treatment of syphilis. Their experience, however, did not coincide with that of the majority of the members of the Academy, who agreed that "606" is the most potent remedy we possess in the treatment of syphilis.

Wechselmann, from his large experience of the use of salvarsan—over nine hundred cases—is greatly impressed by the varied susceptibility of different individuals to this drug, and, while he has seen no serious



mishap from its use, he deprecates its employment in cases with marked arteriosclerosis or cardiac trouble.

Owing to the active hyperæmia which occurs in and around the syphilitic lesion after a dose of "606" has been given, its use in intracranial syphilis, and particularly in syphilitic meningitis, must be carefully regulated. Gilbert records a case of specific meningitis in a child aged 9 years where a dose of .2 grm. of salvarsan was followed by most alarming epileptiform convulsions which threatened life, but which were successfully combated. The numerous minor complications attending the use of this remedy only serve, however, to emphasise the wonderful curative properties which it has now been universally shown to possess.

D. P. D. WILKIE.

#### OSTEO-ARTHRITIC COMPLICATIONS OF MEDITERRANEAN FEVER.

The present-day knowledge of the surgical complications of Mediterranean or Malta fever is defined in a recent paper by D. Zesas (*Arch. génér. de chir.*, 25th January 1911). It has recently been established that the pains frequently observed in the limbs and trunk, which used to be ascribed to myositis and neuralgia, are in reality due to an infective osteitis set up by the micrococcus melitensis. The infection is characterised by the presence of painful points, always epiphyseal in position, and situated close to a muscular insertion. Around the tender spots is an area of tumefaction. These foci tend slowly to disappear without suppuration. It has not yet been settled whether the arthropathies of Mediterranean fever are due to a primary infection of the epiphysis, or whether the micrococcus can directly attack the synovial membrane. According to Zesas, primary synovitis frequently occurs, and his view is strengthened by clinical evidence of the readiness with which the tendon sheaths, bursæ, pleura, and peritoneum are attacked. Phocas has recorded a case of Malta fever which was ushered in by a typical attack of appendicitis, and proceeded to a fatal issue in spite of the removal of the appendix. In general, the arthritis lasts about a fortnight, then gradually disappears, and subsequently recurs in other joints. The most frequently affected are the hip, knee, shoulder, and elbow-joints. The prognosis is favourable, and no case of suppurative osteo-arthritis has yet been recorded. At the same time immobilisation is apt to be followed by obstinate ankyloses. Post-mortem, the appearances in an infected long bone are: irregular and knobbed surface; periosteum thickened and stripping with difficulty; surrounding the bone a thick reddish rind, rugose, and somewhat friable; medullary canal slightly enlarged (Brault, *Acad. de méd. de Paris*, 7th June 1910).

JAMES LOCHHEAD.

## MODIFIED INCISION IN SUPRAPUBIC CYSTOTOMY.

Howard Kelly describes a method of approach by which he has been able to gain improved access to the interior of the bladder (*Surgery, Gynecology, and Obstetrics*, January 1911). The object is to overcome the difficulty of drawing aside the recti muscles with their overlying fasciæ, and he states that this can be accomplished by dissecting the fasciæ from the muscular bellies. With the patient in the Trendelenburg position, a semilunar incision, concave towards the umbilicus and about 6 ins. long, is made through the skin and fat of the abdominal wall an inch above the symphysis pubis. The flap of skin and fat is dissected up, and the exposed deep fasciæ over the recti and oblique muscles are divided transversely and separated from the deeper structures by blunt dissection and in the middle line by knife or scissors. The recti muscles now lie flaccid and can be widely drawn apart. The bladder is then transfixed by two fixation sutures, pulled up into the wound, and opened transversely between them. The transverse incision gives the widest possible opening without risk to the peritoneum. The urethra and ureteral openings come prominently into view. In closing the bladder the surgeon should utilise the perivesical fasciæ in the outermost row of sutures. The recti are drawn together and the deep fasciæ are stitched in position. If necessary, a drainage opening may be left in the median line.

JAMES LOCHHEAD.

## PYLOROSPASM.

Spasm of the pylorus is usually secondary to pyloric or duodenal ulcer or associated with the presence of gall-stones. It is rarely idiopathic. When the condition persists there are symptoms of pain and vomiting, and there may be visible peristalsis in the stomach. Occasionally the pylorus may be felt as a smooth oval tumour. The differential diagnosis from organic stricture is not easy. A rice meal given at night and followed by lavage in the morning may be a useful test. In organic stricture almost the entire quantity is recovered, whilst in pylorospasm the amount of rice recovered will be found to vary at different times. The introduction of the duodenal bucket may also help to differentiate the conditions. The bucket will rarely pass the pylorus in organic stricture, whilst it usually reaches the duodenum in pylorospasm. That the bucket has entered the duodenum is ascertained by noticing that the thread next the bucket is bile-stained for a short distance (10 to 15 cm.). If more of the thread is coloured, bile has regurgitated into the stomach, and no conclusion can be drawn regarding its passage through the pylorus. The treatment of pylorospasm must be directed to the primary lesion. In idiopathic cases,

and also in others where the primary lesion cannot be eliminated, Max Einhorn (*Med. Record*, 21st January 1911, p. 97) has found stretching of the pylorus by a special dilator of great value. The instrument consists of a thin rubber tube 1 m. in length, attached to the distal end of which is a small rubber balloon covered with silk; beyond the balloon is a small metal end-piece. The balloon can be distended or deflated by a graduated syringe attached to the end of the rubber tube. The end-piece, with rubber bag collapsed, is swallowed by the patient. This is best done at night, as it takes some time for the apparatus to pass into the duodenum. In the morning the balloon is distended with air and the tube drawn slightly outwards.

If the pylorus has been passed resistance to outward traction is felt, and when the pylorus is reached the instrument is tightly grasped and further withdrawal arrested. By means of the syringe the balloon is now gradually deflated till with a slight pull it passes through the pylorus.

The author has used this apparatus in nine cases, and states that the stretching may be repeated once a week. The results obtained were uniformly good. The chief features of the cases were, dilatation of the stomach, stasis of food, and increased peristalsis. In one case the patient was too reduced to stand an operation, and would probably have succumbed had the pylorus not been stretched.

JAMES M. GRAHAM.

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## OBSTETRICS AND GYNECOLOGY.

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and

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### CÆSAREAN SECTION IN THE UNITED KINGDOM.

AT the last meeting of the International Congress of Obstetrics and Gynecology held at St. Petersburg there was a discussion on Cæsaean section, and for it Amand Routh collected all the cases by British operators. The details of these he has published (*Journ. of Obstet. and Gynec. of the Brit. Emp.*, January 1911), with valuable statistical tables as to indications and results. There are in all 1282 operations by over 100 operators. The indications for the operation were:—(1) Obstruction to labour due to contracted pelvis (1058), fibroids (74), cancer of cervix (33), ovarian tumour (28), stenosis of cervix (8); (2) uterine hæmorrhage, accidental (4), placenta prævia (7); (3) eclampsia (10); (4) miscellaneous (60).

In discussing the indications in cases of contracted pelvis the alternative procedures of induction of premature labour, craniotomy, and pelviotomy are considered. With regard to *premature labour* there is an almost unanimous opinion that this is a good and safe procedure in cases seen during pregnancy in which the conjugate diameter is not less than  $3\frac{1}{4}$  ins. in a flat and  $3\frac{1}{2}$  ins. in a generally contracted pelvis. The maternal mortality is less than 1 in 200, and the foetal mortality is also small if the induction be not done before the thirty-fifth week and the delivery occurs spontaneously. The exact time for induction must be judged by the relative sizes of the foetal head and the pelvic brim. If the head does not present and external version cannot be performed, labour ought not to be induced but the patient allowed to go to full time and delivered by Cæsarean section. The best method of induction is Krause's—by gum elastic bougies.

*Craniotomy* on the living child is being less and less employed in this country, but there are circumstances in which it is still the operation of choice, viz. in cases of obstructed labour where there have been attempts at delivery and there is the probability of sepsis having been introduced. The average mortality in general practice is about 8 per cent. and the morbidity about 20 or 30 per cent. The maternal mortality from Cæsarean section in such cases is higher than 8 per cent. When the child is dead craniotomy should of course be employed in preference to any of the other operations, unless the conjugate diameter is less than  $2\frac{1}{2}$  ins., in which case Cæsarean section must be done.

In the United Kingdom neither *symphysiotomy* nor *pubiotomy* have been much practised, most operators preferring the induction of labour if the case is seen during pregnancy, and Cæsarean section if it is not seen until labour has begun. Many operators, however, regard it as an alternative to craniotomy and Cæsarean section when, in the second stage of labour, the head cannot be delivered with forceps and only a little more room is required. The objection to the operations is the high maternal morbidity attending them. Most of the operators agree in regarding 3 ins. as the smallest conjugate in which to perform the operation, and most regard primiparity as a contra-indication.

Coming to Cæsarean section itself, the indications depend on the size of the pelvis, and also on the stage of labour the patient has reached and the amount and character of the interference previous to the patient being seen. In a pelvis with a conjugate of less than  $2\frac{1}{2}$  ins. the indication is absolute. With a conjugate between  $2\frac{1}{2}$  ins. and 3 ins. there is a strong relative indication if the child be alive and there is no probability of sepsis having been introduced. In a pelvis with conjugate between 3 and  $3\frac{1}{2}$  ins. there may be a choice between craniotomy, pelviotomy, and Cæsarean section. If there has been no interference, and the child is alive, Cæsarean section is indicated. If the head is partly within the pelvis, and forceps have failed, pelviotomy



would be the ideal if the maternal morbidity could be eliminated. In all cases where the child is dead or where there is a strong presumption that sepsis is present, craniotomy ought to be preferred.

It is in the cases of pelvic contraction, where, from attempts at delivery by the natural passages, there is the probability of septic infection having occurred, that the chief difficulty in determining on the proper procedure arises. The mortality from Cesarean section in such cases is very high. These statistics bring out the following figures:—Cases operated on after forceps application or repeated examination showed a mortality of 34·3 per cent.; cases operated on after rupture of membranes, but in which no attempts at delivery had been made, showed a mortality of 10·8 per cent.; cases operated on during labour, but with membranes unruptured, had a mortality of 2·2 per cent.; and those operated on before labour had a mortality of 3·6 per cent. It is therefore exposing a patient to a very serious risk to perform Cesarean section after rupture of the membranes, and especially after attempts at delivery. It must be presumed that all such cases are septic, and it is possible in some, by examining a swabbing from the interior of the uterus, to prove this. There is a great field for further investigation in this matter, for by bacteriological examination it should be possible within an hour to say whether the case is an infected one or not. In such doubtful cases the method adopted by Maxwell, of irrigating the uterine cavity thoroughly before the operation, might be more universally employed. In doing the operation the uterus should be delivered out of the incision before it is opened. Where there are definite signs of infection supravaginal hysterectomy ought to be done after the child is delivered. In a large proportion of these infected cases, however, the best treatment is craniotomy, preceded and followed by thorough intra-uterine irrigation. Pelviotomy has no place in such cases, as the maternal morbidity is so high.

The question as to whether a patient should be sterilised after Cesarean section is a very difficult one, and Routh gives the opinions of a large number of British operators. The majority agree that the decision must rest with the patient and her husband after the facts have been carefully put before them. If they wish sterilisation to be done the surgeon ought not to refuse.

In accidental hæmorrhage Cesarean section is called for in the concealed cases where the uterus is greatly distended and absolutely atonic. It should be followed by supravaginal hysterectomy. In placenta prævia it should only be employed in cases of rigid cervix and central implantation when the mother is not collapsed and the child is alive and near full term.

For eclampsia the majority of British operators agree that Cesarean section should not be done unless the patient is steadily getting worse and the cervix is undilatable.

COMPRESSION OF THE ABDOMINAL AORTA BY A RUBBER BAND IN  
POST-PARTUM HÆMORRHAGE.

The method described by Momburg some three years ago for arresting hæmorrhage from the lower part of the body by the application of a rubber band round the waist has been extensively adopted by surgeons and obstetricians. Guéniot (*L'Obstétrique*, January 1911) deals with the subject from the point of view of the obstetrician, and gives a summary of all the literature. In France manual compression of the aorta has been recognised as a valuable aid in the treatment of post-partum hæmorrhage since the time of Baudelocque. This method is, however, very fatiguing, and Momburg's method is a distinct advance. The band used should be about the thickness of the finger, the ordinary rubber douche tube being suitable and always available. The patient should, if possible, have the pelvis raised so as to allow the intestines to gravitate towards the diaphragm. One or two turns of the tube are put round the abdomen and fastened, or an assistant on each side can make traction downwards on the tube laid across the abdomen. In very fat women a compress may be put under it. The band should be sufficiently tight to stop pulsation in the femoral arteries. This can in nearly all cases be done, as the abdominal parietes are so lax. The tube should be tightened gradually and loosened in the same way so as to avoid sudden alterations in the arterial pressure. It may be left on for as long as two hours, but this is rarely necessary in post-partum cases. Momburg recommends that before the tube is taken off the legs should be elevated, or a band applied round each thigh, which is loosened gradually after the abdominal band is removed.

The results in post-partum hæmorrhage are almost uniformly good. The bleeding is arrested immediately in the great majority of cases, and as a rule the atonic uterus contracts firmly, often expelling a large quantity of clotted blood. The results are equally good in hæmorrhage due to a flaccid uterus in post-partum hæmorrhage after placenta prævia, and in that due to tears of the cervix and vagina. Most of those who have used the method describe it as marvellous in its results.

The dangers attending its application are not many in obstetric cases. There is no injury to the skin of the abdomen or to the intestine or peritoneum. One or two cases have been recorded where there has been a slight temporary paresis of the bladder and of the lower extremities, but these have quickly passed off. There is no bad effect on respiration. There are, however, decided effects on the pulse and blood pressure in many cases, especially at the time of application and loosening of the tube. There is no constancy in these—the pulse sometimes becoming faster, sometimes slower; the blood-pressure in some cases rises, in others falls. The elevation in blood-pressure is

most marked when the hips are not elevated, as in such the superior mesenteric vessels may be compressed by the tube. In old patients with dilated hearts and arteriosclerosis these sudden changes in pressure have caused alarming symptoms, and in some cases death. In the ordinary obstetric case, however, there is little to be feared, and the method is one which ought to be widely known, as it can be so readily applied and requires a minimum of assistants.

#### ON TUBERCULOSIS OF THE UTERINE APPENDAGES.

Recently the question has been much discussed as to whether tuberculosis may arise primarily in the genital tract in women, and the consensus of opinion is that this must be regarded as an extremely rare occurrence. In this connection a paper by Loiacono, giving the results of twelve cases operated on by Leopold in Dresden, is of interest.

In the *Archiv. für Gynækologie* (Bd. xxxix. p. 312) Loiacono reports that nine of the patients were between 20 and 37 years of age, the tuberculous process being most frequent during the period of sexual vigour. In almost every case the condition was secondary to tuberculosis of the lungs. There were not always symptoms of this during life. In two, caseating glands were found only on post-mortem. Eight of the patients were sterile. No symptoms characteristic of tuberculosis of the appendages were present, some slight pain and disturbance of menstruation being all that the patients complained of. The tubercle bacillus was only found in secretions. The ovary was rarely involved in the tuberculous process. The microscopic examination of the tube showed in four cases underneath the peritoneum elongated spaces lined with epithelium. In the muscular wall was small-celled infiltration, but rarely tuberculous nodules. The mucosa was infiltrated with round cells, typical tuberculous nodules with giant cells. The folds of the mucosa were swollen and sometimes adherent so as to form cysts containing serous fluid. More frequently the tube was found distended with caseating material, and in these the mucosa was destroyed and the muscular wall thin, infiltrated with leucocytes, and studded with tuberculous nodules. Only in a few cases was the diagnosis made before operation, and often only on microscopic examination of the parts removed. The prognosis was unfavourable, and three of the patients died immediately after operation, due to associated complications of the lungs.

## INFECTIOUS DISEASES.

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## TYPHOID SPINE.

FRICK (*Interstate Med. Journ.*, November 1910) reports three cases of this interesting condition. The first, a male of 31 years, about fifty days after his temperature had become normal and five days after returning to work was suddenly attacked by severe abdominal pain. The pain soon became localised in the back, and the slightest attempt at movement caused him great distress. There was some moderate fever and distinct tenderness to the right of the twelfth dorsal spinous process. After about ten days a curious feature developed, the abdominal muscles contracting rhythmically with every pulse-beat. This symptom lasted a week, and was only absent when the patient was asleep. Improvement commenced within four weeks of the onset of the pain, and two months later he had completely recovered. In the second case, a boy of 18 years, the pains began in the lower part of the back about eight weeks after the temperature had become normal, and after he had been exposed to wet and cold. The temperature was febrile, the pelvis was held rigidly fixed, and there was localised tenderness over the fifth lumbar vertebra. The patellar reflexes were increased and ankle clonus was present. The pains disappeared after a week's complete rest, and except for a slight stiffness of the back the patient was completely well within three months from the onset of his symptoms. The third patient, a male of 46 years, suffered from a severe attack of typhoid fever, followed by relapse. The pain in the back commenced nine days after his temperature had settled. The onset was accompanied by chills, and there was considerable fever. In this case the pain radiated round the body and down both legs. It was most severe in an area extending round the left side from the spine at the level of the last two dorsal and first lumbar vertebrae. Reflexes were normal. The fever lasted several weeks, but he improved gradually, and was working about four months after his first symptom.

Frick gives a very complete review of the literature of the subject, mentioning most of the eighty cases which have been described. After a careful analysis of their principal features he is able to give us a fairly definite clinical picture of typhoid spondylitis. He points out that while the symptoms occasionally appear during the latter part of the febrile stage of typhoid fever, they are, as a rule, not seen until convalescence, and often as late as three or four months after the illness is over. Sometimes there is an exciting cause, such as a fall, an injury, or exposure to chill. The first symptom is nearly always pain in the



back. It is constant and greatly aggravated by the slightest movement. It is usually in the lumbar region, sometimes a little higher or lower. Fever is present in most of the cases. It is of an irregular type, and may last from a few days to several weeks. Neurotic symptoms are often described, but Frick thinks their importance has been exaggerated and the complaints of the patient are very natural and genuine. The symptoms directly due to the pathological process are tenderness, rigidity of the spine, swelling, redness, kyphosis and scoliosis. Many of these may, however, be absent, redness, for example, having been only described in three out of fifty-three cases. The symptoms due to pressure on nerve roots or cord are referred pains, hyperæsthesia, paræsthesia, spasticity, and the rhythmic abdominal contractions noted above, which were also observed in a case of M'Crae's. The reflexes are often exaggerated, and absence of the knee-jerks is very rare. The duration of this complication of typhoid fever varies from about a month to two years or more.

The prognosis of typhoid spondylitis is good. Practically all the cases reported have recovered completely even if scoliosis has been present. As to the pathology of the condition, it is reasonably certain that a definite organic lesion is present in spite of the opinion of Osler, who up to quite recently has been inclined to regard "typhoid spine" as a neurosis, at least in the majority of cases. Other suggestions have been that there may exist an inflammatory condition of the nerve sheaths in the vertebral canal, or that the symptoms may be attributed to a lepto-meningitis. It is probable, however, that the body of the vertebra is affected, and that the lesion is analogous to the other bone lesions so well known in typhoid fever. The pathological process does not, on the other hand, seem to lead to the formation of pus.

Typhoid spondylitis must be distinguished from a general neurosis, neuralgia, lumbago, sciatica, psoas abscess, and different affections of the spinal cord. The possibility of another cause for the spondylitis, such as tubercular or pneumococcal infection, must also be considered. The treatment is simple. Complete rest is essential, and jackets of leather or plaster of Paris, extension, or the application of strapping may have to be employed. For the pain, hot applications give most relief. Frick suggests that in a prolonged case vaccine therapy might be found useful.

#### MYOCARDITIS IN SCARLET FEVER.

Weill and Mouriquand (*Presse médicale*, 11th January 1911) discuss sudden death in scarlet fever, with especial reference to the presence of myocarditis. They oppose their own experience to the statement made by others that in all cases in which an autopsy has been practised nothing seriously wrong with the cardiac muscle has been detected. They describe the case of a man of 19 years of age admitted to hospital

on the second day of an attack of scarlet fever. The attack was severe, with ataxic and adynamic symptoms. The eruption was typical and well developed. The pulse was of low tension and rapid—152, the temperature  $106^{\circ}$  F., and the spleen appreciably enlarged. An attempt was made to bathe the patient, but he had an attack of syncope which prevented any further attempts at that form of treatment. For four days the temperature oscillated in the neighbourhood of  $104^{\circ}$  F., the pulse remained rapid and was occasionally intermittent, and the heart sounds were foetal in character. The patient continued to be delirious. On the sixth day of illness arthritis of the wrists and knees was noted. The pulse became very variable, at one moment 142 and shortly afterwards only 70, sometimes regular and strong, sometimes very weak and irregular. Death occurred in a sudden syncope. At the autopsy the myocardium was found to be soft and pale, and extensively infiltrated with leucocytes. Neither the suprarenals nor thyroid showed any lesions, and the observers conclude that the cause of death was to be found in the condition of the myocardium. They review the literature on the subject and find that extremely few cases of this sort have been recorded. Their own case certainly does not resemble an ordinary case of toxic scarlatina, and its course would suggest an extremely severe simple case complicated with a definite myocardial lesion. Sudden death in scarlatina is far from common, but on the rare occasions on which it occurs it might certainly be well to make a systematic examination of the myocardium.

#### SERUM TREATMENT OF TYPHOID FEVER.

Rodet and Lagriffoul of Montpellier report (*Presse médicale*, 24th December 1910) the results of treatment with an antityphoid serum prepared by themselves. They have collected records of sixty-five patients, all of whom received their first injection before the eleventh day of illness. All appeared to be genuine cases of the fever from the clinical point of view, and of forty-two in whom the serum reaction was positive before injection only one died. Among the remaining cases there were three deaths, which may have been partly due to mixed infection, as no fewer than seven patients gave a positive reaction to the micrococcus of Malta fever as well as to the typhoid bacillus. Of the whole sixty-five, then, four died, six had intestinal hæmorrhage, two phlebitis, and four relapsed.

The patients were treated at different times, in different hospitals, and by different observers. In some the systematic bath treatment was also used, in others serum alone was employed. In both groups more than 50 per cent. showed almost immediate improvement after the first injections, that is to say, a well-marked lysis set in before the fifteenth day of illness, often, indeed, as early as the tenth or eleventh.

This high proportion of cases of short duration is certainly very striking. No reaction, such as Chantemasse noted in his cases, followed the injection, but the fall of the temperature did not as a rule start until twenty-four or thirty-six hours had elapsed. A few cases, chiefly those in which there was mixed infection or some doubt as to whether the illness was not of longer duration than eleven days, did not improve. Others, again, required two or three injections before the improvement started. The amount of serum injected was usually 5, sometimes 10, c.cm. The largest number of doses given was four, the interval between the doses about two days. With the fall of the temperature there was a general amelioration in the symptoms of the patient.

Judging from the charts which accompany the article the cases selected appear to have been at least of average severity. The numbers are too small for accurate conclusions to be drawn, but it must be admitted that the results are very impressive. It may be added that, with the exception of one urticarial rash and one case of arthralgia, there were no examples of serum sickness in the series.

#### TYPHOID VACCINATION.

Russell (*New York State Journ. of Med.*, December 1910) reviews the various British and German methods of preparing typhoid vaccine and gives some of the results obtained. The method employed by himself for vaccination in the United States army is as follows:—A strain of the bacillus, which has been for many years under cultivation and has practically lost its virulence for animals, is used. Cultivations are made upon agar in a number of large Kolle flasks. The cultures are incubated for eighteen hours and each flask is carefully scrutinised for contamination before washing off the growth in salt solution. The emulsion is collected in litre flasks, which are sunk in a water bath and kept at 55° to 56° C. for one hour after they reach the temperature of the bath. The emulsion is standardised by counting the bacteria. After the emulsion is cooled it is diluted with salt solution and  $\frac{1}{4}$  per cent. of tricresol is added. To avoid the risk of contamination with tetanus it is tested on mice and guinea-pigs. For practical use only fresh vaccines, less than 4 months old, are employed, but they have been proved efficient even after a year. The first dose given contains 500,000,000 bacteria in  $\frac{1}{2}$  c.c. of salt solution. The skin is prepared by treatment with tincture of iodine and the injection made at the insertion of the deltoid muscle. The second and third doses are twice the size of the first, and are given at intervals of ten days.

As to the occurrence of a general reaction later, Russell gives most interesting statistics. A large proportion of the men vaccinated do not appear to suffer at all, even after the first dose. In 59 per cent., indeed, no reaction was noted, and after the second and third doses

reaction was entirely absent in 68 per cent. and 78 per cent. respectively. In 34 per cent. of the men there was a mild reaction and in 66 per cent. a moderate reaction after the first dose, and this proportion was considerably reduced after subsequent injections. In less than 1 per cent. was the reaction severe, that is to say, the temperature rose above 103° F., and in the remainder a moderate reaction, over 100°, was noted. No really unpleasant results were observed, and in a series of 34,284 inoculations there were no instances of hypodermic abscess. As to the results of typhoid vaccination in the United States, Russell observes that about one-seventh of the army has been vaccinated and that five cases with no deaths have occurred among them. In the other six-sevenths of the force there have been not 30 cases but 418, with thirty-two deaths.

Richardson and Spooner (*Boston Med. and Surg. Journ.*, 5th January 1911) discuss antityphoid inoculation as introduced into certain training schools for nurses in Massachusetts. The preparation of the vaccine used was almost identical with that of Russell, except that the added antiseptic was  $\frac{1}{4}$  per cent. lysol. Up to date, 405 nurses have been vaccinated, the number of inoculations given being four at five-day intervals. The initial dose was 50 millions, increased gradually to a maximum of 200 millions. In 90 per cent. there was at most a very slight reaction, and in 10 per cent. a moderate reaction. Only one nurse was off duty and that for twelve hours only. In contrast to the experience of the ten previous years, there were no cases of typhoid fever among the nurses of the Massachusetts General Hospital during 1909 and 1910.

Those who are especially interested in this subject should read the admirable summary by Vincent (*Bulletin de l'académie de médecine*, 24th January 1911) for the committee of the French Academy deputed to investigate typhoid vaccination. The conclusions are, that vaccination is efficacious and free from risk, and that it should be practised in the French army and navy and particularly in troops destined for Algeria and the colonies. Others for whom it might be useful are doctors, hospital residents, students and nurses, young persons who have come from the country to towns in which the fever is endemic, and the families of typhoid "carriers."

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## DISEASES OF THE NOSE AND THROAT.

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and

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ON THE TREATMENT OF ACUTE OTITIS MEDIA BY BIER'S  
CONGESTION METHOD.

THE attention of aurists has been again turned to the treatment of acute inflammation of the middle ear and mastoid cells by Bier's congestion method by the publication of a monograph upon the subject from the pen of Professor Eschweiler of Bonn, who was associated with Bier in the observation of the ear cases which were subjected to this line of treatment (*Die Stauungshyperæmie nach Bier in der Ohrenheilkunde*, v. Professor Eschweiler, in Bonn). As the method has not found favour amongst aurists in this country, it will not be out of place to give a brief description of the way in which the treatment is applied and of its results in Eschweiler's hands. The application of congestion therapy to purulent conditions in immediate contiguity to the cranial cavity has been regarded by many with considerable disfavour, and the experience of some observers has certainly not been of such a kind as to encourage further trial of the method. The pioneer work and extended experience of Eschweiler therefore become of greater interest.

It is important that *the technic* of the treatment should be carefully studied, as there is no doubt that the surgeon has been disappointed, and failure has followed his efforts by reason of faulty technic. The constricting elastic bandage is applied round the neck, and both the amount of pressure and the manner of fixing the bandage require considerable care. Eschweiler has employed exclusively the woollen spun elastic garter, which offers the best and cheapest form of applying pressure. For the adult a bandage  $2\frac{1}{2}$  cm. and for the child 2 cm. in breadth is used, one end being provided with a small hook, the other with several eyes at a distance of 1 cm. from each other. It is necessary to prepare such a bandage for each patient, the length being first ascertained by measurement, and then the hook and eyes arranged so that the required constricting force can be applied. As the place where the hook is situated exerts rather more pressure than the rest of the bandage, a small piece of felt, half a centimetre in thickness, is placed beneath it, while the hook is made to lie over the muscles upon the side of the vertebral column. In fat individuals who perspire easily, in children, and in very thin subjects in whom there is not much covering over the bones, the skin may become irritated if the bandage has to be

applied for any length of time. In such cases it is necessary to place beneath the elastic band a strip of wool or bandage about 4 cm. broad. When the thyroid cartilage is very prominent one must, if possible, apply the bandage lower down on the neck, and if this cannot be done, then a piece of felt placed upon each side of the cartilage is of service; care also is necessary in connection with the cervical spinous processes. The skin of the neck must be kept clean, and powder or ointment used when necessary. As indiarubber loses its elasticity, especially in contact with the warm skin, it has to be frequently renewed, and on each occasion the new bandage must be carefully tested as the elasticity of different pieces of indiarubber varies. The same bandage should not be employed longer than eight days.

It is obvious from these instructions which are laid down that great care is necessary if the treatment is to be correctly carried out. The difficulty further lies in recognising the exact amount of elastic pressure that is to be applied, and it is not easy to lay down rules to guide the beginner. One may say, however, that the most important and reliable degree of pressure in head congestion is the subjective sensation of the patient after the congestion has been commenced. The maximum amount which is bearable is the best. In addition to the subjective sensations certain objective appearances assist us in regulating the pressure. Thus, if correctly applied, the patient's face becomes slightly swollen (*gedunsen*) and the skin somewhat cyanosed. It can be readily understood, however, that the personal factor must be taken into consideration, some individuals, from their temperament, being unable to tolerate very slight pressure from the bandage, complain of a choking sensation. It is necessary to allay their fears and to assure them that the treatment will not be forced upon them, and that the bandage will be at once removed in the event of a continuance of the discomfort or if any untoward symptoms should arise. The psychical element can thus be dealt with, and if the patient be kept under the observation of the physician for a short time the pressure can be altered from time to time until the discomfort passes off.

A most valuable indication of the correctness of the application is to be found in the cessation of the pain which the inflammatory condition has produced. If the earache increases after the bandage has been adjusted, then its application is faulty. If within two hours there is no cessation, it will then probably be necessary to increase the tightness of the bandage. It is obvious therefore that the patient must remain under the immediate supervision of his medical attendant until the correct degree of pressure has been reached. In hospital this is more feasible, and it is on account of this preliminary difficulty that the utility of the method is somewhat restricted.

Once the bandage is comfortably in position it should remain upon the neck for twenty-two hours out of every twenty-four. The patient

therefore sleeps and eats without having it removed. He probably appreciates the two hours of relief most fully if it is given to him at dinner-time. During this interval the oedema which has collected in the tissues is reduced and the hyperemic vessels empty themselves. If the normal appearance of the face has not returned, it will be necessary to prolong the interval, and sometimes it is necessary in the early stages of the treatment to have a second interval of about two hours. The duration of the treatment varies, and will be referred to presently. Apparently none of the important organs in the head are adversely influenced by this method; the eyes have not been affected, and in no case has any disturbance arisen from congestion of the inner ear. Eschweiler has not found the existence of diabetes to be any contra-indication.

The treatment of acute otitis media with or without suppuration by Bier's congestion must be combined with such treatment as is usually employed in these conditions. Children should be confined to bed, but this is not necessary in the case of adults. The group of cases in which there is acute inflammation and suppuration of the mastoid cells is of the greatest practical interest, because in them the question of a mastoid operation arises, and if such can be avoided by this therapeutic means an important step has been gained. It is in connection with pus in the mastoid cells that so much opposition has been raised and warning notes have been sounded. It is impossible in so brief a review to follow the writer in detail; it must suffice, therefore, merely to note some of his observations. In his opinion the most satisfactory form of mastoiditis for Bier's treatment is that in which there is a superficial abscess over the mastoid process. When the patient is first seen the meatus must be cleansed and the drumhead examined; if there is no perforation, paracentesis may be necessary, or if the perforation is not regarded as a satisfactory one it should be enlarged. The superficial abscess over the mastoid must then be opened through a small incision carried down to the bone; with a probe the cortex is explored and the position of a fistulous opening in the cortex ascertained. No packing or drain is inserted into the soft parts, but merely a dressing and bandage applied. The elastic bandage is then applied round the neck for twenty-two hours, to be followed by an interval of two hours in which the bandage is removed. In those cases in which an abscess has formed there follows a marked oedema over the mastoid process in addition to the swelling above the bandage already described. In the interval the meatus is again cleaned and the incision over the mastoid is opened up with a probe. In a few days the discharge from the wound is no longer purulent, but becomes of a serous character. At the same time the discharge from the meatus diminishes, and the infiltration of the soft parts behind the ear becomes less. So long as the bandage remains applied the drumhead maintains

a certain degree of redness and swelling. If this favourable course continues one may shorten the period of congestion, so that for two periods of eight hours each the bandage may be kept on, while later a further reduction may be tried. Of fifteen cases of acute mastoid disease with abscess of the soft parts thus treated, all were cured without operation. The duration of the treatment varied from twelve to twenty-eight days, giving an average period of twenty-one days. Other types of cases are discussed in this monograph, and failures are duly recorded, while the adverse views of other aurists are dealt with. Its perusal will certainly arouse the interest of the reader.

#### THE ETIOLOGY AND TREATMENT OF VASOMOTOR RHINITIS.

The etiological factors in this disease are in many cases quite obscure. The condition is met with in all ages and in every class of life. Among the predisposing causes a neuropathic disposition must be placed first; there must also be a local morbid condition of the nasal mucous membrane, which may or may not be associated with gross pathological changes, and there must finally be an irritant acting either from without or within the body itself. As examples of external irritants, the pollen of certain grasses and the direct rays of the sun may be mentioned. The causal effect of internal irritants is more difficult to demonstrate, but Grayson expresses the opinion that dietetic indiscretions resulting in a chronic autotoxæmia bring about this condition (*Trans. Amer. Laryngol. Assoc.*, 1910), and that without this systemic condition the neurotic nose would be unknown.

Hack, in 1884, was the first to attribute the nasal symptoms to a turgescence of the anterior ends of the inferior turbinated bodies, resulting in great tension of the mucous membrane, which were interpreted as the stimulating factor in the nerve end apparatus. Later, Hack and other observers demonstrated the presence of pathological hyperæsthetic areas on the inferior and middle turbinated bodies and on the septum.

Although it is one of the more common affections of the nose, vasomotor rhinitis is at the same time one of the most difficult to treat successfully, and unfortunately we know of no method of treatment which will ensure a permanent cure, though in the majority of cases it is possible to relieve the symptoms for a variable period of time.

The difficulties which are experienced in our therapy are no doubt due to there being a nervous element in this affection, so that general or constitutional treatment is required as well as local interference. The individual case should be studied from all aspects, and especially the habits of the patient inquired into as regards the use of alcohol, tobacco, tea, and coffee. Occasionally the restriction of tobacco or alcohol alone will have a markedly beneficial effect on the condition.



As regards local treatment, many methods have been advocated. Undoubtedly the application of the galvano-cautery, which was first suggested by Hack, still holds a foremost place. It is advisable to use the edge of the burner rather than the flat surface, and to burn a deep furrow along the whole length of the inferior turbinated body, and thus as it were to tack the mucous membrane down to the bone.

Watson Williams (*Rhinology: A Text-Book of Diseases of the Nose, &c.*, 1910) recommends spraying the nose with a solution of biniodide of mercury (1 in 10 or 1 in 20). This treatment has proved highly successful in his experience in many cases, but the pain following the injection is sometimes so great that morphia has to be given. If applied at the onset of symptoms of hay fever the patient will sometimes remain free for the whole season.

O. J. Stein (*Laryngoscope*, September 1908) has recommended anaesthetising the nasal branches of the fifth nerve by the injection of alcohol into the nasal cavities. The nasal branch and, if necessary, the branches of the sphenopalatine ganglion are treated. The injections are made by a syringe fitted with two different needles. The first, a straight needle, is inserted into the tissues just posterior to the nasal bone, that is, the anterior extremity of the cribriform plate. The second needle is longer and has a curved tip, and is introduced at the posterior end and lower border of the middle turbinated body. Five drops of alcohol are used at each injection.

Yonge (*Lancet*, vol. ii. 1909) has had good results by resecting the nasal nerve.

Muck (*Munch. med. Wochenschr.*, No. 29, 1909) advocates the application of cold water by means of a spray to the back of the neck.

Semon recommends constitutional treatment by gradually increasing doses of arsenic.

In cases of paroxysmal rhinorrhoea Waggett (*Brit. Med. Journ.*, 26th November 1910) has been in the habit of administering calcium lactate internally, sometimes combined with magnesium, and has been successful in the majority of his cases.

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## NEW BOOKS AND NEW EDITIONS.

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*The Dawn of the Health Age.* By BENJAMIN MOORE, M.A., D.Sc.,  
M.R.C.S. London: J. & A. Churchill. Price 3s. 6d.

THIS is one of the most interesting books we have read for a long time, and one may almost say of it as reviewers do of sensational novels, that once taken up it is not likely to be laid down till the last page is turned. And it must be admitted that it is a little sensational. Dr. Moore has

called to his aid all the devices of the literary artist, and he has laid bare many of the weak points of our profession. His theme is that prevention is better than cure, and he argues forcibly for the establishment of a National Medical Service whose efforts shall be directed to the care of the health rather than to the cure of disease.

His criticism of our present hospital system must be admitted to be largely true, and his comparison of a charitable with a poor law hospital (actual examples under pseudonyms) involves a serious condemnation of the latter. Not that the former gets off uncriticised: there are very few members of our profession of whatever rank who will not wince now and again in reading Dr. Moore's book.

A very interesting chapter on the Great White Plague contains the startling propositions that "had Koch's tuberculin treatment been a success we should probably be suffering now from more prevalence of tuberculosis, simply because we should have still more neglected precautions and preventive measures than we have done;" and "the possession of a most powerful specific remedy for a given disease, *with our present-day modes of practice and employing it*, may produce little or no effect upon the death-rate from the disease." And he makes out a very good case, for he takes chlorosis, syphilis, diphtheria, and malaria, for each of which there are remedies deserving the name of specific, and asks whether these remedies have done anything to diminish the number of cases. The two which have been most successfully dealt with are chlorosis and malaria, and these have been diminished by methods of prevention. The book makes a most timeous appearance, and we cordially commend its perusal to all who are interested—and who is not!—in the problems which confront the profession to-day.

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*Clinical Pathology in Practice.* By THOMAS J. HORDER, B.Sc., M.D., F.R.C.P. Pp. i.-x., 1-216. London: Henry Frowde and Hodder & Stoughton. 1910. Price 7s. 6d. net.

A SENTENCE from the Introduction of this book serves well enough to suggest its purport—"To change the physician for the pathologist can but end in disaster; but to add to sound clinical observations the findings of the microscope and the test-tube sums up all the notable advances made in medicine since the days of Laennec." Some of our profession, the happy possessors of a store of personal experiences and impressions, may be disposed to undervalue laboratory methods; others fall into the opposite mistake of relying too largely on them, and of asking from clinical pathology more than it (as yet) can give. The volume before us is an admirable corrective to both these errors, so evenly does the author hold the scales between the newer and the older ways. The object of Dr. Horder's book is twofold: first, to describe in a practical manner all the really useful pathological tests; second,

to show that these methods may be almost as conveniently employed in private as in hospital practice. The latter function we regard as not less important than the former, because undoubtedly there is often some disinclination to extend to private patients the benefits of the more precise methods which modern clinical medicine has at her disposal. Proceeding on these lines the author discusses the bacteriology and cytology of the blood, the sputum, and the fluids of the body, the fæces, the specific tuberculin tests, complement-fixation tests, and vaccine therapy. Any reader with even a little personal knowledge will recognise from the way in which the methods are described that Dr. Horder, though an expert, has not forgotten the difficulties a beginner meets with. As an instance, we cite the technique of blood puncture, in which, *inter alia*, we are told to direct the needle against the blood current, so that blood may flow from it without suction. The point is obvious when attention is directed to it, yet seven out of eight beginners will perform the puncture in the opposite direction. Space forbids a discussion of all Dr. Horder's facts, but, since few are open to criticism, this is of little moment. Good features of the book are the distinctions drawn between methods which may and ought to be employed by the practitioner himself and those for which he must apply to a laboratory, and between "bad" reports which contain inferences, often unjustifiable, and "good" reports which give only facts, leaving deductions therefrom to the clinician. Taking it all over, Dr. Horder's manual seems to us much the most useful work of the kind which has yet appeared, and we hope that it will have a long and successful career.

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*Disease of the Pancreas: Its Cause and Nature.* By EUGENE L. OPIE. Second Edition. Pp. 381. Philadelphia and London: Lippincott Company. 1910. Price 15s. net.

THE writer of this book is recognised as one of the foremost authorities on the subject of disease of the pancreas, and his own observations have contributed not a little to the advancement of knowledge in this direction.

In this volume he gives the results of his own observations, and also discusses fully the opinions of other authorities. The first hundred pages are occupied with the history of the investigations of the anatomy of the pancreas from ancient times; with the discoveries of Wirsung and Santorini; the modern observations, from those of Langerhans onwards; the anomalies of the organ; its histology; its relation to digestion, and particularly to carbohydrate metabolism.

While apparently all diseases of the pancreas receive due attention, the pathology of certain special diseases which are as yet obscure have been discussed in much detail. Amongst these are included

hæmorrhagic necrosis, chronic pancreatitis and diabetes mellitus in relation to the pancreatic changes found in that disease. The author presents data which would show that in all cases of diabetes mellitus, whatever be the other changes in the pancreas or in other organs and tissues, the important lesions are always to be found in the islets of Langerhans, which appear to be specially concerned with carbohydrate metabolism.

Amongst other pathological conditions discussed are tuberculosis and syphilis of the pancreas, pancreatic calculi, cysts of the pancreas, malignant growth, hæmochromatosis and bronzed diabetes.

Enough has been said to emphasise the importance of this book to all teachers of medicine and surgery, and to all who desire to keep themselves in touch with the latest investigations on the subject.

*A Manual of Practical Inorganic Chemistry.* By A. M. KELLAS, B.Sc., Ph.D. Pp. 345. London: Henry Frowde and Hodder & Stoughton. 1910. Price 5s. net.

*Introduction to Practical Organic Chemistry.* Pp. 204. Same Author, Publishers, and date. Price 3s. 6d. net.

DR. KELLAS has had many years' experience as head of the department of chemistry in the Medical School of the Middlesex Hospital, and in these manuals he offers to teachers and students the results of his experience. Both books are characterised by the systematic manner in which the matter is presented, and by the careful attention paid to exact detail in the instructions given for practical work. To take an example at random. On pages 61-62 of the *Inorganic Manual* we find a list of the normal, acid, basic, and double salts, the preparation of which is described in the section of the book immediately following the list.

The list is not a mere enumeration of compounds but conveys definite information, *e.g.* under the heading *normal nitrates* we have

*Typical Preparations.*

Potassium nitrate,  $\text{KNO}_3$  (B.P.)  
Barium nitrate,  $\text{Ba}(\text{NO}_3)_2$   
Lead nitrate,  $\text{Pb}(\text{NO}_3)_2$

*Additional Examples which could be Prepared in a Similar Way.*

$\text{NaNO}_3$ ,  $\text{NH}_4\text{NO}_3$   
 $\text{Ca}(\text{NO}_3)_2$ ,  $\text{Ba}(\text{NO}_3)_2$   
 $\text{AgNO}_3$  (B.P.),  $\text{Fe}(\text{NO}_3)_3$  (B.P.)  
 $\text{Hg}(\text{NO}_3)_2$  (B.P.),  $\text{Zn}(\text{NO}_3)_2$   
 $\text{Mg}(\text{NO}_3)_2$

Such tables are very helpful to the serious student when taken in conjunction with the clear and explicit practical directions given for carrying out the typical preparations. Thus a whole page is devoted to the preparation of potassium nitrate from caustic potash and nitric



acid, and every mistake which the most ingenious perversity could achieve is foreseen and provided against in the instructions.

The analytical section of the *Inorganic Manual* is equally satisfactory. The tests are judiciously selected and the summaries of properties and reactions are well done. Besides ordinary qualitative testing, an introduction to gravimetric and volumetric analysis is given, and also a few examples of gas-analysis.

The *Practical Organic Chemistry* contains the following sections:— I. Qualitative Elementary Analysis; II. General Laboratory Operations; III. Typical Preparations; IV. Specific Tests and Analysis; V. Detection of Typical Groups; VI. Quantitative Analysis. The Appendix gives some extra tests, and special quantitative methods.

A welcome feature in the book is the short section on group reactions. By a few simple tests the student can ascertain whether he is dealing with an acid, an ester, an alcohol, a ketone, &c. This form of testing is generally neglected, and yet it is at the basis of all organic testing which is not restricted to a definite syllabus for which special schemes may be devised.

Both volumes can be warmly recommended to the medical student who interests himself in chemistry.

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*Medical Electricity and Röntgen Rays.* By SINCLAIR TOUSEY, A.M., M.D. Pp. 1116. Philadelphia and London: W. B. Saunders Company. 1910.

WE find in this bulky volume an endeavour, on the part of Dr. Sinclair Tousey, to record faithfully all that has been done in the past in practically the whole field of medical electricity.

The task is a Herculean one, and it reflects much credit on Dr. Tousey's industry and perseverance that he has attained so large a measure of success in his undertaking. We must, however, agree with him in thinking that to be really up to date in electrical subjects an author should confine himself to articles in weekly magazines.

The opening chapter gives very full directions as to the management of the static machine, the physiological effects of this form of electrical discharge, and the technique of its administration.

A long chapter on Dynamic Electricity follows, which should prove valuable to those who are interested in the construction of voltaic cells, series and shunt motors, etc., but we fear that the majority of medical practitioners are content to leave these matters in the hands of the instrument makers.

Next follow chapters on the Physiological Effects of Electricity, Electro-diagnosis, Ionic Medication and Electricity in Diseases of the Nervous System. Very full directions are given as to the use of the

high frequency current in disease, and Dr. Tousey has been more than usually successful with this method of treatment—in combination, it should be added, with weak doses of the X-rays—every condition he mentions, and they are many, having received benefit. In mucous colitis he considers the treatment to be almost a specific; but surely the “large strong young woman” who had suffered from this disease for four years, who, in spite of medicinal treatment by her brother, who is a prominent Board of Health physician, had “twenty-five bloody movements a day” for a whole month, and who was completely cured after ten applications, must have been a malingerer.

Over four hundred pages of the book are devoted to the consideration of the Röntgen ray, and here, more than anywhere else throughout the book, Dr. Tousey suffers from his inability to cope with the rapid advance made in the science of radiology.

In points of technique we are bound to protest against many of his recommendations. Thus for a lateral view of the frontal sinuses (p. 824) 40 to 60 seconds of exposure with the anticathode 12 to 14 inches *from the plate* seems to us a needlessly long exposure and dangerously short distance with the intensity of current he uses, and so with urinary calculi we can only charitably conclude that Dr. Tousey had not sufficient time to revise his proof sheets, or surely he would not have recommended an exposure of 150 seconds with the anticathode 18 to 22 inches from the plate and a primary current of 15 amperes, and, further, we consider interrupted exposures both unsatisfactory and unnecessary.

The illustrations are numerous and, as a rule, good, but we fail to see what object is gained by using photographs of the nude female upon which to indicate the motor points; such realism is quite uncalled for, and in the words of an American surgeon of repute indicates a “want of decorum.”

A carefully prepared index proves very useful, more especially as it includes the names of the numerous authors who have been freely quoted.

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*Hints for the General Practitioner in Rhinology and Laryngology.* By Dr. JOHANN FEIN (Vienna). Translated by J. BOWRING HORGAN, M.B. Pp. 223. 42 Illustrations. London: Rebman, Limited. 1910. Price 5s.

THE translator has worked under Dr. Fein in Vienna, and is anxious to make some of the principles of his teacher better known in this country. The author himself takes a very modest view of what may safely be taught to the general practitioner concerning laryngology and rhinology. The classification adopted is not so much pathological as symptomatic. Diseases of the larynx, for instance, are dealt with

under the headings General Symptoms, Disturbances of Phonation, Respiratory Troubles, Pain in the Larynx; then follow a few remarks on tuberculosis, cancer, syphilis, &c. The book contains many useful hints, especially in regard to the methods of examination, and, on the whole, the choice of subjects for extended comment has been judicious. The work is not without a touch of humour. Thus in describing an unsuccessful incision in a case of quinsy the author writes: "The incision, which is so hopefully performed, results in blood and disappointment, instead of pus and relief."

The object of the book is to help the practitioner to diagnose diseases of the nose and throat and to treat the simpler conditions himself. In marked contrast to what we find in other recent works very few drugs are recommended in this book, but those mentioned are really useful. The translation has been well done.

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*A Handbook of the Surgery of Children.* By Professor E. KIRMISSON.  
Translated from the French by J. KEOGH MURRAY, F.R.C.S.  
Pp. 812. London: Henry Frowde and Hodder & Stoughton.  
1910. 20s. net.

PROFESSOR KIRMISSON'S handbook will be read with profit by all interested in the surgical aspects of disease in children. It is divided into four sections dealing respectively with surgical affections of congenital origin, injuries in childhood, inflammatory lesions and disorders of nutrition, and neoplasms. The descriptions of the morbid anatomy and clinical features of the conditions dealt with are full and good, and call for no special comment. Chief interest naturally lies in the sections devoted to treatment, for in these are recorded the personal opinions of the author founded on his wide and varied clinical experience.

Surgeons and practitioners will find much that is suggestive and helpful in the directions and advice which Professor Kirmisson has to give, and some will no doubt find special comfort in his marked preference for conservative and palliative measures whenever these offer an alternative to operative methods. In his recommendations for the treatment of club-foot, inguinal hernia, appendicitis, and all forms of surgical tuberculosis, to give some prominent examples, this conservative attitude is very marked. Although his faith in such methods is evidently firm, Professor Kirmisson states his opinions in general terms, unsupported by any detailed analysis of the material which has passed through his hands, and he may therefore fail to carry with him those who are sceptical of the value of trusses in curing inguinal hernia in infants, of the value of non-operative treatment in appendicitis and other conditions in which operative measures seem to offer a speedy and effective means of treatment.

A disappointing feature of the book is the absence of reference to many conditions to which attention has been directed in recent years. Among these may be mentioned congenital stenosis of the pylorus, idiopathic dilatation of the colon, tubercular osteomyelitis of the shafts of long bones, and vaccine treatment. Bier's methods of inducing passive congestion are dismissed in a single paragraph, as if hardly worth consideration. On the whole it may be said that while the book is interesting as presenting the views of an experienced surgeon, it fails to satisfy, because the outlook of the author is in many respects that of one who does not seem to be fully aware of what has been done by recent workers. The translator has done his work well, but has evidently felt constrained to try to compensate for omissions in some sections of the book and to modernise others, by adding comments along with brief extracts from the writings of other surgeons, a method which serves to accentuate defects without supplying an entirely satisfactory remedy.

*Fractures and their Treatment.* By J. HOGARTH PRINGLE, M.B., F.R.C.S.  
Pp. 384. With 142 Figures. London: Henry Frowde and  
Hodder & Stoughton. 1910. Price 15s.

THIS volume, one of the well-known Oxford Medical Publications, maintains the high standard established by the other numbers of the series. Strange to say, a considerable time has elapsed since the publication in this country of a special work on fractures, and with the impetus given to their study by the discovery of the X-rays and the insurance of workmen against injuries the want of a modern textbook has become more and more apparent. For these reasons alone this volume is deserving of welcome, but the author has done more than merely fill a gap. By judicious selection, based on a wide experience, he has given in a comparatively short compass an account of the mode of production and the treatment of fractures, which the practitioner may safely peruse without the dread of being confused by unnecessary details. A clear lead is given for the treatment of each fracture, and although we may object to the exclusion of this or that method, the advantage of brevity to the student and country doctor is obvious. Of the thirty-one chapters, eleven deal with fractures in general. The description of spiral fractures is worthy of special note, and the illustrative diagrams are valuable. With regard to Lucas Championnière's methods, he sums up as follows:—"The great difficulty in accepting them for all cases is the impossibility of avoiding osseous deformity, though, for certain cases, I believe they are admirable." Great importance is attached to the extension methods of treating fractures of the long bones. The author's attitude on the operative treatment by wiring and plating is of interest at the present time. He says: "I



fix primarily all subcutaneous fractures of the diaphyses where I cannot overcome deformities, of which the most important is shortening; or get rid of the interposition of muscle, etc.; and all fractures where the fragments are separated by muscular tension, *e.g.* patella, olecranon, tuberosity of humerus, os calcis, or trochanter of femur; and I fix most of the open fractures that I have to treat." In addition, he is of opinion that the majority of intra- and para-articular fractures should be treated by incision and fixation. Five chapters are devoted to fractures of the skull and their complications, and these might profitably have been allotted more than two diagrams. The remaining chapters are taken up with the bones of the limbs, and a valuable essay on fractures in relation to workmen's compensation, the value of which is enhanced by tables indicating the amount of depreciation in working efficiency after certain injuries. As was to be expected, the letterpress and illustrations are excellently done.

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*The Principles of Gynaecology.* By W. BLAIR BELL, B.S., M.D.(Lond.), Assistant Gynaecological Surgeon, Royal Infirmary, Liverpool.  
London: Longmans, Green & Co. 1910. Price 21s. net.

IN this book the author has departed from the method of treating the subject usually adopted in text-books of gynaecology. Instead of taking up each organ separately and dealing with all the pathological conditions met with in it, he devotes separate chapters to each pathological process as it affects the different pelvic structures. Thus, one chapter deals with the infective and parasitic diseases of the genital tract, another with retention and effusion cysts, a third with innocent neoplasms, and so on. While this method has the advantage of saving unnecessary repetition, it is doubtful if, for the student beginning the study of the subject, it offers any advantage over the usual method of arrangement. A special feature of the book is the lucid way in which the author deals with the physiology of the pelvic organs, incorporating all the recent advances. Functional disturbances are also fully considered, and the latest methods of treatment explained. The relationship between the internal secretions of the ovary, thyroid gland, pituitary body, and suprarenals is discussed, and the possibilities of treatment with their various extracts, explained. The author's well-known views on the part the calcium salts play in physiological and pathological processes are fully set forth in different parts of the book.

There is a section on gynaecological operations. The descriptions are brief and to the point, and the illustrations are exceptionally good. Throughout the text there are numerous photo-micrographs of pathological conditions, and, while some of these are not very clear, the

majority are good and fulfil their purpose of giving the student an exact idea of pathological appearances, as distinct from the erroneous impression conveyed by so many of the diagrams still in use in some text-books. For these reasons the book is adapted to the needs of the student, while it will also appeal to those interested in the scientific aspects of gynaecology, and to the practitioner seeking a reliable guide to the diagnosis and treatment of the common functional gynaecological ailments.

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*Wounds in War. The Mechanism of their Production and their Treatment.*

By Colonel W. F. STEVENSON, C.B., K.H.S., R.A.M.C. (Retd.). Third Edition. Pp. 559. With 137 Illustrations. London: Longmans, Green & Co. 1910. Price 16s.

THE publication of a third edition of this book in a comparatively short space of time is its best advertisement. The first five chapters are devoted to general military surgery, the sixth to the twelfth inclusive to regional surgery, the thirteenth describes the use of X-rays in war hospitals, and the fourteenth gives a comprehensive view of field ambulance and stretcher work in the field. The articles of the Geneva Convention, 1906, are a fitting finish for such a work.

The author would like it to be clearly understood that military surgery is a speciality. That portion of the first chapter which describes the mechanism of projectiles is one of the best parts of the book; it is a model of conciseness, and makes a somewhat intricate subject simple and fascinating to follow. In comparing the effects of experimental bullet wounds in the living and the dead, little attention is paid to the comparative elasticity of living tissue. In discussing the so-called "wind contusions," Sir T. Longmore's explanation is accepted as final.

Concussion of the cord due to the rapid passage of a rifle bullet in its near vicinity, without actual mechanical injury, may give rise to symptoms and results similar to those due to actual division of the cord.

Bullet wounds of the abdominal cavity justify immediate operation only if the surroundings are favourable, but it must be remembered that they are not so in mobile field units.

Strychnine is considered "a most valuable drug in the treatment of shock." The author recommends that suppurating joints should be irrigated with 1 to 20 carbolic or 1 to 500 corrosive sublimate; there is no mention of this being followed by sterile water.

There are many interesting questions brought up, especially with regard to experiences in the late South African and Russo-Japanese wars, too numerous, however, to discuss. The printing is good and the illustrations are well selected. The X-ray photographs of injuries to bones by rifle bullets are typical. The term "English" is used with

irritating frequency when reference is made to the late South African and other wars in which the British army has participated.

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*Manual of Practical Anatomy.* By the late D. J. CUNNINGHAM. Fourth Edition. Revised by Arthur Robinson. With 237 Illustrations, 101 of which are in Colour. London: Henry Frowde and Hodder & Stoughton. 1910.

IT is scarcely necessary for us to do more than record the fact that a new edition of Cunningham's *Practical Anatomy* has appeared. This guide has a unique place in the student's working library, and although with each re-issue we find it difficult to see in what directions further improvement is possible, every successive edition has proved an advance on its predecessor.

It is matter for congratulation that Professor Arthur Robinson, the successor of the distinguished author in the Chair of Anatomy in the University of Edinburgh, has undertaken the work of revision. The continued success of the manual is thus assured.

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*The Ship-Surgeon's Handbook.* By A. VAVASOUR ELDER, M.R.C.S. Second Edition. Crown 8vo. Pp. xii. + 387. London: Baillière, Tindall & Cox. 1911. Price 5s. net.

THIS little volume is designed to act as a guide to men who are taking up the duties of surgeon on board the mercantile marine, and as such it can be safely recommended. The questions of outfit and appliances—with useful hints about the care of instruments, drugs, etc., at sea—are considered, and in this edition a special chapter is added on Ship Etiquette and Customs, and the question of the entry on the "log" of purely professional matters of diagnosis is discussed at some length. Two chapters are devoted specially to the American service, where the immigration restrictions are so rigidly enforced, hints being given as to how the surveying of a polyglot ship's complement may best be managed. The author's view as to the importance of the occurrence of syphilis in any member of the crew is rather contradictory. On page 149 he says cases of "syphilis, both primary and secondary, need not necessarily be excluded except in case of a member of the victualling department;" and on the next page "a very early case should be excluded in all departments." The book contains many practical details which will be distinctly helpful to any medical purposing "going down to the sea in ships."

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NOTES ON BOOKS.

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THIS volume on the *History of Medicine*, by Dr. Max Neuburger, translated by Ernest Playfair, Vol. I. (Henry Frowde and Hodder & Stoughton), may be welcomed as one of the few modern well-proportioned accounts of the history of medicine. Unlike the large work on this subject bearing the name of Puschmann, and edited by the present writer in conjunction with Professor Pagel, it is not a work merely of detail and reference intended for the scholar and the investigator, but aims rather at telling the story of the development of medical art in a way which attracts the attention of the general reader. It therefore forms an excellent book for those men who interest themselves in the history of their profession as a relaxation, while the name of the writer is sufficient guarantee for its correctness of opinions as well as of details. In the present volume the history is carried from the beginnings of medicine up to the early Middle Ages. Especially interesting are the chapters upon Eastern Medicine; an excellent account is given of Galen, and the rôle of the Arabs as preservers of medical tradition during the Middle Ages is happily described, but the chapters upon the Hippocratic writers are somewhat disappointing. The book may be confidently recommended to everyone seeking general information upon this subject, while the translation has been so well done that a most easy and readable book is the result. We shall await the appearance of Vol. II. on Modern Medicine with great interest.

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The fact that *Diagnostics of Internal Medicine*, by Dr. Glentworth Reeve Butler (Appleton & Co.), has reached its third edition is sufficient evidence that it has proved acceptable to practitioners and students. It is now provided with 5 coloured plates and 272 illustrations, many of which are very helpful and original. We have found especially well systematised and useful, from the student's point of view, the sections dealing with the circulatory and respiratory systems. The section upon diseases of the blood has been much improved since the last edition, but instead of Plates III. and IV. giving very roughly the supposed appearances of blood-films others might suitably be substituted. The sections on examination of the stomach contents and faeces and the examination of the nervous system have been remodelled, and altogether the book is thoroughly revised. Part II., called "Diagnosis, Direct and Differential," which comprises over one-third of the whole, might really be a separate work forming in a sense a complement to Part I. In it the various diseases are taken up seriatim, and lists of their symptoms are given. The student will not probably refer often to this part of the book, but the practitioner would frequently find its paragraphs full of



useful reminders. Of the many books upon clinical methods this is one of the most concise and full.

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We have received the new edition (12th) of *Pye's Elementary Bandaging and Surgical Dressing*, revised by W. H. Clayton-Greene, F.R.C.S., and V. Zachary Cope (John Wright & Sons, Ltd.). The task of revising and of bringing up to date another author's work is one of considerable difficulty, and the result is not always satisfactory. The defects in this book proceed, for the most part, from the original form of the work. For its size the book attempts to be too comprehensive, and loses thereby in thoroughness. Much that is purely medical is still included.

The sections on bandaging and surgical dressings are occasionally wanting in clearness and precision. Fractures are dealt with only in accordance with first-aid or ambulance methods of treatment.

Long and involved sentences are not infrequent, and in many instances the diagrams could be improved. On the other hand there is a considerable amount of useful and necessary information excellently expressed. In its present form this well-known work will prove of greater service to surgical dressers than the previous editions.

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*Modern Surgery*, by J. Chalmers Da Costa, M.D. (W. B. Saunders Company), has now reached the sixth edition. It forms a large volume of fifteen hundred pages, and contains almost a thousand illustrations. The main features of the book are already widely known, and need not be particularised. In the present edition the work of revision has affected almost every section, and accounts of arteriorrhaphy, the use of positive and negative pressure in intra-thoracic surgery, Wright's views on inflammation, the Wassermann reaction for syphilis, and many recent surgical procedures are included to bring the book up to date, and make its perusal more valuable to the student. A special chapter is devoted to the X-rays, Finsen light, Becquerel's rays and radium in their surgical aspects. The illustrations are, on the whole, well chosen and clearly reproduced, but the volume has now become so large as to be unwieldy, and might with advantage be split into two.

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*Genito-Urinary and Venereal Diseases*, by J. William White, M.D., and Edward Martin, M.D., ninth edition (J. B. Lippincott Company), is likely to attain, or even overstep, the popularity accorded to the previous editions. The book remains an essentially practical one for the physician, and the authors have incorporated only such changes as have been generally accepted by the leading authorities. The chapters on Syphilis, which extend to one hundred and forty pages, are lucidly written and excellently illustrated. The description of perineal prostatectomy is also worthy of special mention, and its value is

enhanced by the reproduction of Young's diagrams. As a standard work of reference, the book can safely be recommended both to the practitioner and to the young surgeon.

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The fourteenth edition of *The Extra Pharmacopœia of Martindale and Westcott*, revised by W. Harrison Martindale, Ph.D., and W. Wynn Westcott, M.B. (H. K. Lewis), has undergone the usual thorough revision which previous editions have received, and has had added to it a number of chapters on new branches of therapeutics. We now find a full résumé of the literature of soured milk therapy, and a completely new chapter on radium, in which free use has been made of Rutherford and Soddy's work on radioactivity. Vaccines occupy considerably more space than hitherto, and the section contains much practically useful information. Another new chapter deals with the organic arsenical compounds, up to, but not including, the very latest—salvarsan. Not less valuable than the strictly therapeutic and pharmaceutical part of the book are the addenda in the last 150 pages—analytical and bacteriological memoranda and other miscellaneous information. Owing to the amount of new matter incorporated in this edition it has been found necessary to enlarge the page, thus for almost the first time altering the outward appearance of *The Extra Pharmacopœia*. The change is, we think, a decided improvement, and makes the ever-indispensable "Martindale and Westcott" a much more handy volume than previously.

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*Hæmoglobinuria*, by Dr. Ambrose E. L. Charpentier (Baillière, Tindall & Cox), is simply a summary carefully prepared from recent literature upon the subject of hæmoglobinuria, particularly the paroxysmal form, and would form a useful starting-point for anyone wishing to make a study of the subject.

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It is little over two years since we favourably noticed Mr. Arthur Cooper's work on *The Sexual Disabilities of Man and their Treatment* (H. K. Lewis). In the second edition, now before us, there is some new matter, and the text has been thoroughly revised. We can confidently renew our recommendation of this useful guide to a difficult subject.

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The success we anticipated for Mr. Bidwell's *Handbook of Intestinal Surgery* (Baillière, Tindall & Cox) has been realised, and we have before us a second edition, in which the recent advances in the technique of this branch of surgery are incorporated. No better guide could be put into the hands of the student of operative surgery. In a supplementary chapter the preparation of the patient before operation and the after-treatment of abdominal cases is discussed.

*Practical Nursing for Male Nurses in the R. A. M. C. and other Forces*, by Major E. M. and A. R. Hassard (Henry Frowde and Hodder & Stoughton) is an excellent little manual, and the authors are to be congratulated on the production of a book that will prove most useful and profitable to any nurse—male or female—who masters its contents. It contains thirty-six chapters, written in an interesting and attractive manner. Many of them begin with a short yet lucid description of the system or disease dealt with, making the reasons for treatment, as well as the details which follow, much easier to understand. The information given is precise and exact, and shows that the authors have had much practical experience of the details of nursing, and of the complications likely to arise in the course of illness. The book is one of the most practical of its kind with which we have met.

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In his work on *Normal Histology* (eighth edition), Dr. George A. Piersol (J. B. Lippincott Company) claims "to present descriptions which should include the salient features of the various structures with sufficient fulness to impress important details without wearying minutiae," and he succeeds admirably in his object. The result is a volume rather larger than the ordinary students' text-book, but of more convenient dimensions than the existing works of reference. The book includes several admirably clear diagrams of the gross anatomy of the central nervous system, for the reason that the student of medicine often has to study the microscopic details of organs before he is acquainted with their gross anatomy. This difficulty is not unknown in Edinburgh, and there is comfort in the thought that it is so cheerfully acquiesced in by a teacher in progressive Philadelphia. The book is fully illustrated. Most of the figures are of great merit. A few are excellent, and only one or two (notably No. 55) are poor. Controversial points are handled with great care, but one of the vexed questions of muscle structure is got over by the inclusion of a diagram after Heidenhain showing the "usual view" and "correct view" side by side. In an appendix there is an account of some useful methods of histological technique. It is very short but sound, and so clearly put that we could have wished for some more instruction in the same fashion.

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Dr. Winklereid Williams has prepared a complete index of the *British Journal of Dermatology* since its first appearance in 1888 down to the end of 1909, which cannot fail to be of much service to those interested in the subject. Not only will it save them much time in looking up references, but a lot of useful information is to be gained or recalled to the memory by moving slowly over the pages, even though it does seem rather like reading a dictionary.

*Recherches d'anatomie chirurgicale sur les artères de l'abdomen : Le tronc cœliaque*, par Pierre Descomps, pp. 210 (Paris, G. Steinheil), is the first of a series of studies on the arteries of the abdomen, and in it are published the results of the investigation of the cœliac axis and its branches in fifty adult subjects.

It represents in small compass a series of very careful and painstaking dissections. The cœliac axis, its three branches and their ramifications in every case have been noted, and their dispositions and peculiarities compared and analysed. In addition to the notes on the fifty subjects, there are copious and useful references to the literature.

The hepatic artery with its branches has proved by far the most interesting, and its discussion occupies almost five-sixths of the volume. In connection with its branches, the cystic and bile ducts have been dealt with incidentally.

The volume will prove of much service as a work of reference to anyone interested either anatomically or surgically in the cœliac region, and in this connection especially the illustrations add greatly to the value of the book. They are clear, well defined, and convincing, and number nearly a hundred.

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Dr. Mauban's little monograph on *Air-Swallowing* (*L'aérophagie*, Paris, G. Steinheil, 1910) contains all the facts that are known concerning a symptom which is probably a more common cause of gastric flatulence than is generally supposed. The treatment is simple and satisfactory when, but only when, the nature of the condition is recognised, and no one who reads this concise manual ought to have any difficulty in correctly diagnosing a case of air-swallowing.

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*Endocrinologie: nouvelles études sur la physio-pathologie du corps thyroïde et des autres glandes endocrines*, by Drs. Léopold-Lévi and Henri de Rothschild (O. Doin & Sons), is an interesting book, in which there is embodied a large amount of valuable information. The authors give a very extensive survey of the literature on the subject, they report much careful work, and they give expression to many thoughtful opinions on the subjects under discussion. The book is consequently well worthy of careful study. But it is too long and too diffuse. The subject is a vast one and necessarily ill defined at the present day. The authors, unfortunately, have allowed themselves to be enticed by the breadth of the argument into prolixity of ideas and of details which tends to obscure their main theses.

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## BOOKS RECEIVED.

H. K. LEWIS.—*Salvarsan* (606). By Martindale and Westcott. Price 5s. *Landmarks and Surface Markings of the Human Body*. By L. B. Rawling. 4th edition. Price 5s. *Practical Bacteriology, Blood Work and Parasitology*. By E. R. Stitt. 2nd edition. Price 6s. 6d. *Hygiene and Public Health*. By Parkes and Kenwood. 4th edition. Price 12s. 6d. *Public Health Laboratory Work*. By H. Kenwood. 5th edition. Price 10s. *Enlargement of the Prostate*. By C. Mansell Moullin. 4th edition. Price 6s. *Meningitis, Sinus Thrombosis, and Abscess of the Brain*. By John Wyllie. Price 6s. 6d. *The Practitioner's Medical Dictionary*. By G. M. Gould. Price 18s. BAILLIERE, TINDALL & COX.—*A Manual of Medicine*. By T. K. Munro. 3rd edition. *Military Sanitation and Hygiene*. By E. Blake Know. Price 5s. *Aids to Bacteriology*. By Moor and Partridge. 2nd edition. Price 3s. 6d. *Radium*. By Dawson Turner. Price 5s. *A Manual of Medicine*. By T. K. Munro. 3rd edition. EDWARD ARNOLD.—*Modern Methods of Water Purification*. By Don and Chisholm. Price 15s. *Food and the Principles of Dietetics*. By R. Hutchison. Price 16s. CONSTABLE & CO. *The Surgery of the Diseases of the Appendix Vermiformis*. By Battle and Corner. 2nd edition. Price 10s. 6d. *A Pocket-Book of Treatment*. By R. W. Leftwich. Price 6s. BALE, SONS & DANIELSSON.—*Modern Surgical Technique*. By Yelverton Pearson. 2d edition. Price 10s. 6d. *The Bradshaw Lecture on Cancer*. By Sir A. Pearce Gould. Price 3s. 6d. WALTER SCOTT PUBLISHING Co.—*The Jews*. By M. Fishberg. Price 6s. REBMAN, LTD.—*Essentials of Modern Electro-Therapeutics*. By F. F. Strong. Price 4s. *Surgery of the Genito-Urinary Organs*. By J. W. S. Gouley. Price 8s. *Expansion of Races*. By C. E. Woodruff. Price 17s. *Climatic Treatment of Children*. By F. L. Wackenheim. Price 6s. 6d. *Handbook of Treatment of Diseases of the Eye*. By Curt Adam. Price 10s. Cesare Lombroso. By Hans Kurella. Price 4s. 6d. *Treatment of Syphilis by the Ehrlich-Hata Remedy*. By Johannes Bresler. Price 2s. 6d. OTTO SCHULZE & Co.—*Text-Book of Nervous Diseases*. By Professor Oppenheim. 2 Vols. 5th edition. W. B. SAUNDERS Co.—*Text-Book of Surgical Anatomy*. By W. F. Campbell. 2nd edition. Price 21s. *The Anatomic and Histological Processes of Bright's Disease*. By Horst Oertel. Price 21s. *Vaginal Celiotomy*. By S. Wyllie Bandler. Price 21s. *Principles and Practice of Modern Otology*. By J. F. Barnhill. 2nd edition. Price 24s. *Personal Hygiene and Physical Training for Women*. By Anna M. Galbraith. Price 10s. *Practical Treatment*. Vol. I. Edited by Musser and Kelly. 3 Vols. Price 75s. *Sahl's Diagnostic Methods*. Edited by N. B. Potter. Price 27s. 6d. SHERRAT & HUGHES.—*Feeble-mindedness in Children of School Age*. By C. P. Lapage. Price 5s. *Cesarean Section*. By Armand Routh. Price 5s. J. B. BAILLIERS ET FILS.—*Maladies de l'Appareil Digestif et de l'Appareil Respiratoire*. By H. Huchard. J. B. LIPPINCOTT Co.—*Diseases of Anus, Rectum, and Sigmoid*. By S. T. Earle. Price 21s. *Fever Nursing*. By J. C. Wilson. Price 5s. *Materia Medica and Therapeutics*. By John Foote. Price 4s. 6d. *International Clinics*. Vol. IV. 20th series. HENRY FROWDE and HODDER & STOUGHTON.—*Diseases of the Spinal Cord*. By R. T. Williamson. Price 15s. *Handbook of Surgery of the Kidneys*. By W. Bruce Clark. Price 10s. 6d. *Text-Book of Massage*. By L. L. Despard.

Price 10s. 6d. Cholera and its Treatment. By Major L. Rogers. Price 10s. 6d. Manual of Bacteriology. By Muir and Ritchie. 5th edition. Price 10s. 6d. WRIGHT & SONS.—Golden Rules of Ophthalmic Practice. By G. Hartridge. Price 1s. Golden Rules for Diseases of Infants and Children. By E. Bellingham Smith. 4th edition. Price 1s. The Medical Annual, 1911. CASSELL & Co.—Gynecological Surgery. By Berkeley and Bonney. Price 25s. Tumours, Innocent and Malignant. By J. Bland-Sutton. Price 21s. J. & A. CHURCHILL.—Manual of Gynecology. By T. W. Eden. Price 18s. Urine Examination made Easy. By T. Carruthers. Price 1s. 6d. Vicious Circles in Disease. By Jamieson B. Hurry. Price 6s. Refraction of the Eye. By G. Hartridge. 15th edition. Price 5s. HENRY KIMPTON.—The Care of Children. By Bernard Myers. 2nd edition. Price 1s. 6d. T. C. & E. C. JACK.—The Bacillus of Long Life. By Loudon Douglas. JAMES NISBET & Co.—Nisbet's Medical Directory, 1911. Price 7s. 6d. P. S. KING & SON.—On the Production of Pure Milk. By Ralph Vincent. Price 6d. MACMILLAN & Co.—The Feeble-minded. By E. B. Sherlock. Price 8s. 6d. WM. J. DORNAN.—Gynecological Transactions, 1910. THE JOURNAL OF NERVOUS AND MENTAL DISEASE PUBLISHING CO.—Outlines of Psychiatry. By William White. 3rd edition. MESSRS. WATTS & Co.—The Origin of Life. By H. Charlton Bashan. Price 3s. 6d. FELIX ALCAN.—Psychologie Pathologique. By A. Marie. Price 25 francs. S. KARGER.—Die Behandlung der Frauenkrankheiten. A. & C. BLACK.—Operative Surgery. By Theodor Kocher. 3rd English edition. METHUEN & Co.—Unsoundness of Mind. By T. S. Clouston. Price 7s. 6d. RIVERDALE PRESS, BROOKLYN.—Transactions of the American Urological Association. HARRISON & SONS.—Report on the Health of the Army, 1909. Vol. LI. WM. GREEN & SONS.—An Introduction to Dermatology. By Norman Walker. 5th edition.

# EDINBURGH MEDICAL JOURNAL.

## EDITORIAL NOTES AND NEWS.

**Royal Infirmary Report.** THE Report of the Edinburgh Royal Infirmary for the year ending 1st October 1910 was issued in February, and "the managers earnestly hope that this Report, which contains a full account of the work and finances of the Royal Infirmary for that period, will be carefully considered, and the claims of the institution for an increased measure of support heartily responded to." The indoor patients were 12,342 and the outdoor patients 38,930, the daily average being 842. In the medical wards the average period of residence was 30·5 days, while in the surgical wards, exclusive of the Lock, it was 21·8 days. We note with interest that the patients came in almost equal numbers from Edinburgh and the country. *Putet omnibus* is still the motto of the Infirmary. There has been a great increase in the numbers of the out-patients in the year 1909-1910, as compared with 1908-1909, although the actual number is only 270 more than in 1906-1907. No explanation is given of this in the Report. It cannot be due to any recent change in the work of the department, as the present régime has been in force for the last four years.

In this year's Report there are in particular two matters of general interest—

1. The visiting arrangements for patients' friends have been revised, but we believe the new scheme is not much, if at all better than the old. The facilities given to the country friends of patients are curtailed, while the town friends of patients get an extra day. The committee know that the facilities for visiting are far in excess of those given in other hospitals, and recognise that the large number of visitors interferes with the work of the hospital, and we cannot agree that their new rules will do much good. It would, we think, be no hardship either to the patients or their friends if fewer visitors were admitted and the number of visiting days diminished. We are satisfied that the noise and bustle of the visitors on a visiting day are deleterious to many of the patients and interfere very materially with the work of the wards. We should like to know if the staff were consulted in reference to this new scheme.

2. The nursing department of a large hospital constitutes one of the most important factors for successful work, and we judge that that department is most ably conducted in the Infirmary at the present time. The nurses deserve much consideration in every way, and the training they receive is of the utmost importance not only to themselves but also for the institution; their manner of work when they leave the Infirmary is a criterion of the nursing in the hospital. The training they receive in practical nursing, which after all is the most important part of their duty, devolves of necessity to a great extent upon the sisters in charge of wards, and it is imperative, therefore, to procure highly-trained and capable sisters, and for this attractive inducements must be given. The new pension scheme we believe to be a wise one, viz. that the sisters will receive a pension of £40, and that no payment on account of premium shall be required from them.

The Report of the Royal Infirmary is instructive, and we hope that those who have the opportunity will study it as it deserves, and not merely give their usual subscription and consign the Report to the wastepaper-basket. The more widely and intimately the affairs of the Infirmary are known the more will its value be appreciated.

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**THE task of the Managers of the Royal Infirmary**

**The New Superintendent of the Royal Infirmary.** to select a successor to Colonel Warburton was no light one, and it was not made easier by the plethora of admirable candidates who presented themselves for the post. The choice fell upon Lieutenant-Colonel Sir Joseph Fayrer, Bart., M.D., R.A.M.C., to whom we offer our hearty congratulations and a cordial welcome. Sir Joseph, who is the son of the distinguished surgeon and soldier who shared in the defence of Lucknow, is not a stranger to Edinburgh. In 1886 he obtained the conjoint diploma here, and the following year became a Fellow of the Royal College of Surgeons after examination. He has on more than one occasion been stationed in Edinburgh Castle and in other commands in the Scottish District. On entering the Royal Army Medical Corps in 1886 he took first place in the competitive examination, and this early success proved to be but the beginning of a distinguished career in the Army.

In addition to a wide and varied experience in purely medical work, both in India and at home, Sir Joseph has had exceptional opportunities of performing administrative duties, particularly during the five years he was in medical charge of the Duke of York's Royal Military School, Chelsea, and while he acted as Staff Officer to the P.M.O. of the London District. He is at present stationed at Hong-Kong, where he is in charge of the Military Hospital and commands the 27th Company R.A.M.C. We understand that Sir Joseph takes up his new duties on the 1st of August.



**The Treatment  
of Incipient Insanity.**

THE Annual Report by Dr. W. L. Martin to the Edinburgh Parish Council, on the Certification of Lunatics and the Relation of the Parish Council to the Infirmary, is a very interesting document. We are surprised at the outset to learn what a large number of pauper lunatics are chargeable to Edinburgh--no less during last year than 1210. The only comfort that can be drawn from this large figure is that it is proportionately a good deal lower than that for Glasgow, the rate per 100,000 being 338 for Edinburgh and 368 for Glasgow. Two hundred and twenty-six fresh cases were certified during the year. The only points of special interest that emerge from these figures are that the occurrence rate is higher among males than among females at all the age periods, and that the occurrence rate is higher over forty-five years than below it.

The main interest of the Report, in view of the recent discussions about the treatment of incipient lunacy, lies in its account of the work done in Ward 3 in the Royal Infirmary. During the last year the Parish Council were carrying out an arrangement with the Managers of the Royal Infirmary by which they were entitled to the use of three beds in the ward for incipient cases. Sixty-five patients were admitted under this arrangement, of whom there were discharged recovered 30, improved 14, and *in statu quo* 3, while 13 were certified and sent to an asylum, and 3 died (2 patients were admitted on two separate occasions). It is evident from these figures that the bargain as to sending in incipient cases was very loyally carried out by Dr. Martin, and the high percentage of recoveries speaks well for the care which must have been devoted to them by the Infirmary staff. The great majority of the patients, and particularly those who recovered, were mild melancholics, or showed the milder types of mental confusion, and most of the excited cases, although they were not numerous, did well. It is inevitable that here again a parallel should be drawn with Glasgow, for that city has been the pioneer, in this country, of hospital treatment of incipient lunacy, and it is interesting to find that a smaller proportion of the Edinburgh cases have been certified than of the Glasgow ones. Dr. Martin, however, makes the very obvious point that this is largely due to the smaller number of beds available in Edinburgh, so that the cases were specially selected and specially suitable.

There has long been full agreement among those who have to deal with the insane that many incipient cases will recover in hospital under treatment, and do not require certification, and it looks as if the time had now come when provision will have to be made by the Parish Council for their reception and treatment. It is interesting to notice that in Dr. Clouston's latest letter to the *Scotsman* he departs from his demand that the Infirmary should take up the matter, and accepts

the view, which we have always regarded as more reasonable, that these cases should be treated, not in the midst of a busy institution, where there is comparatively little peace, quiet, or possibility of recreation for them, but somewhere in the country within reach of town, where there is room for such a building as will allow classification of cases, plenty of air and sunshine, and opportunities for outdoor recreation. Such a place would be infinitely more suitable for the treatment of incipient cases than the often crowded Ward 3, where the curative work of a week is sometimes undone in a day by the necessary admission among convalescent cases of a wildly delirious patient.

**Tuberculosis in  
Aberdeen.**

IN an appendix to his Report on the health of Aberdeen for 1909 Dr. Matthew Hay gives the results of an inquiry into the prevalence of tuberculosis in the city. The inquiry covers a period of fifty-four years, and has yielded many data of great interest, going back, as it does, to the days when the infectivity of the disease was barely suspected, its cause unknown, and crusades against it undreamt of. An outstanding result is the demonstration that the decline in the death-rate from phthisis was nearly as great in the first half as in the second half of the period, and it is hard to resist Dr. Hay's conclusion that general sanitation has had as much to do with the decline as administrative control. During 1856-60 phthisis killed 322 persons per 100,000; in 1909 only 108; and the mortality from other forms of tuberculosis has shown an even greater fall. But the decline in mortality between 1856 and 1885 was just about as great as between 1885 and 1909—an experience which the other large towns in Scotland share with Aberdeen, though in Aberdeen the improvement has been more marked than elsewhere. The ameliorating influences must have been general, not specific—betterment of social and sanitary conditions: better houses, fewer slums; higher wages, cheaper food, cheaper clothes; shorter hours of labour, more wholesome factories. The figures do not support the idea that segregation of consumption has played any important part. It is not, of course, to be inferred from these facts, and Dr. Hay does not suggest that administrative control has been useless. Quite the reverse. We must suppose that sanitation in its broad sense will be most effective in proportion as the evils it has to deal with are greatest, and that when it has removed the grossest defects a more specialised hygiene, such as the “administrative control” we now know, has to be added if progress is to be maintained. One might go a step further and suggest that in the future our most modern precautions will be taken, not as innovations, but as matters of course, and will have added to them in their turn methods of personal prophylaxis which it is at present chimerical to imagine.

Another important matter dealt with is the source of infection,

from milk and from human beings. In Aberdeen about 30 per cent. of all children are bottle-fed, whereas among children dying of tuberculosis during the first five years of life the proportion is 40 per cent. It is curious, however, that the percentages range from 31 in children dying of abdominal tuberculosis to 63 among those dying of phthisis. Further, the incidence of abdominal tuberculosis is smaller among children living in five roomed houses and upwards than in those living in one and two-roomed houses, though the proportion of bottle-fed children is twice as great in the former as in the latter. Inquiry showed that in most cases of fatal abdominal and meningeal tuberculosis one or other of the parents was tuberculous. Aberdeen, however, is unusually fortunate in its milk supply, for during 1905, 1906, and 1909 tubercle bacilli were found in only one sample of milk examined. Here, again, Dr. Hay refuses to depreciate the risks of milk infection: he puts the proportion of bovine cases at one-fifth, and urges that every reasonable precaution to ensure a pure milk supply is more than justifiable. On the general question of the infectivity of phthisis we read that direct exposure to infection was traceable in two-thirds of the patients, but certain facts illustrative of the low degree of the infectivity appear. For instance, in a series of couples of whom one spouse died of phthisis the death-rate from the disease among the surviving spouses does not seem to have greatly exceeded what in the ordinary course of probability would have occurred. Family predisposition (about which we hear so little nowadays) is regarded by Dr. Hay as by no means unimportant, and a remarkable case is quoted in which a healthy married couple, with seven healthy children aged from 15 to 32, had both been previously married to tuberculous spouses, and of both these marriages children had been born. All three families were brought up together under one roof. The children of the earlier marriages, offspring of tuberculous parents, were ravaged by tuberculosis: the offspring of the third marriage, whose parents were healthy, escaped the disease though exposed to infection. Many other points in this valuable study of tuberculosis in a moderately sized urban community might be referred to, but we content ourselves with noting only those of more general interest.

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The Scots Douche. IN a very interesting article on the "Medical

History of Aix-les-Bains," which appeared in the February number of the *Revue médicale d'Aix-les-Bains*, Dr. Henri Forestier has given an account of the origin of that method of treatment which is termed "the Scots douche." Doubtless many a visitor to Aix must have wondered why the procedure had received such a designation. The author of the article points out that, in a practical work on the baths of Aix, published in 1834, Baron Despine describes the *douche écossaise* in the following words:—"We thus term the cold,

tepid, or hot bath, administered under the form of rain; it is the shower-bath of the English. My grandfather, Dr. Joseph Despine, having seen it employed with success in hypochondriacal affections in Scotland, introduced it into Savoy about fifty or sixty years ago."

In a later work, published in 1871, the Baron says that his grandfather, who was appointed Director of the Baths by the Sardinian Government in 1787, was a pupil of Cullen at the University of Edinburgh, and there learnt to employ the cold shower-bath. On his return he introduced this method of treating nervous maladies to Aix, and gave it the name of *douche écossoise*, as a souvenir of the country where he had studied medicine. Although the *douche écossoise* is therefore of Scottish origin, in the sense that it had been a hydrotherapeutic practice, inaugurated by Cullen at Edinburgh, it was only after its introduction to Aix that it received its name by Joseph Despine. These facts have not been quite without witness at Aix, and in the work published by Dr. Auguste Forestier (the father of the author of the article now under consideration) the method is described as having been introduced to Aix by Joseph Despine.

It is a curious point that the shower-bath has never received any special designation in the United Kingdom, which must be regarded as its birthplace. It is indeed only recently that English authors have used any term to distinguish the method, and certain authors both here and in America have within the last few years employed the term "Charcot douche" for the cold shower-bath.

Forestier gives a full description of the original methods of Baron Despine, and goes on to give an account of the various modifications of the processes which are now in vogue at Aix. One very interesting historical detail to which he refers deals with the reasons which probably led Despine to study at the University of Edinburgh. He points out that the chief cause was the high reputation of the University, but he also shows that during the middle of the eighteenth century the hostility which existed between France and Savoy must have favoured the influence of foreign countries on the latter. Although the people and the language of Savoy have always been French, the country was for long independent, and constituted, at the end of the eighteenth century, the centre of the Kingdom of Sardinia, which comprised also Piedmont and Nice, as well as the island from which the state received its designation.

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THE annual meeting of "The Edinburgh Medical Journal," Limited, was held in April, when the directors were able to submit a satisfactory report to the shareholders. The balance of the amalgamation and preliminary expenses has now been written off, and an increased dividend for the year 1910 was declared.



RETROGRADE VENOUS EMBOLISM AS A CAUSE OF  
ACUTE GASTRIC AND DUODENAL ULCER.\*

By D. P. D. WILKIE, M.Ch., F.R.C.S.,

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ABDOMINAL surgery has revealed few facts more striking than the important *rôle* which the omentum plays in numerous pathological conditions. The extraordinary faculty possessed by the omentum for plastic adhesion to any zone of peritoneal irritation, and thus for walling off and localising inflammatory processes, is so constantly evident to the surgeon and to the pathologist that they have almost come to regard the great omentum as a purely beneficent agent in abdominal pathology.

Notwithstanding its peculiar capacity for rapid reaction and repair, it would indeed be strange if the omentum could take part in so much inflammatory trouble and yet come out scathless. That a chronic inflammation of the omentum may remain after the primary seat of infection has healed has been repeatedly demonstrated, but that the omentum may form the channel by which the pathological process may be carried to other organs is a fact that has hitherto received but scant recognition. The intimate anatomical relations of the omentum with the stomach and the first part of the duodenum, especially in regard to their vascular supply, suggest the possibility of morbid conditions in the former spreading or being conveyed to the latter through their vascular connections.

In 1899 von Eiselsberg<sup>1</sup> recorded eight cases of hæmatemesis occurring after operations. In four of these cases the patient had been operated on for hernia; portions of adherent omentum had been removed, and ligatures had been applied to the cut margin of the omentum. In each case on the day following the operation a quantity of altered blood was vomited. Eiselsberg suggested, as an explanation of this complication, that from the thrombosis which occurred in the veins of the omentum at the site where the ligatures were applied, an embolus was set free,

\* The experimental part of this research was carried out in the laboratory of the Royal College of Physicians, Edinburgh, and the expenses of this part of the work were defrayed by a grant by the Carnegie Trust.

and this was carried in retrograde fashion up a gastric vein, and impacting there caused a localised thrombosis: this in its turn determined an area of necrosis of the gastric mucous membrane, and from the small ulcer so caused the hæmorrhage occurred.

First Friedrich<sup>2</sup> and then Engelhardt and Neck<sup>3</sup> carried out series of experiments on animals to investigate this question. In rabbits and guinea-pigs they applied ligatures to the omentum, and, killing the animals some days later, examined the stomach in each case. In about 30 per cent. of the cases so treated some gastric lesion, usually of the nature of punctiform hæmorrhages, less frequently of minute ulcers, was found. These observers found, moreover, small hæmorrhagic or anæmic infarcts in the liver in more than 50 per cent. of the animals. The writer has repeated this experiment on three cats and four rabbits, the animals being killed three days after ligature of the omentum. In one rabbit so treated well-marked hæmorrhagic erosions of the gastric mucosa were found (Fig. 1). The other six animals showed no gastric lesion, but in three of them there were small hæmorrhagic infarcts of the liver.

The occurrence of hæmatemesis in cases of acute appendicitis, particularly during the first few days after operative interference, but also in cases not submitted to operation, has been very frequently noted. Moreover some observers, notably Payr,<sup>4</sup> have expressed the belief that in many cases there is a definite connection between a chronic gastric ulcer and a preceding inflammatory lesion in the appendix. Recently W. J. Mayo, Moynihan, and Paterson<sup>5</sup> have all suggested that there is a direct relationship between duodenal ulcer and appendicitis. These facts suggested several questions which seemed to lend themselves to experimental investigation. In the first place it was desirable to know whether the veins of the omentum were specially liable to thrombosis; secondly, whether, in the event of these veins becoming thrombosed, emboli tended to separate and to enter the portal circulation; and thirdly, whether it were possible or probable that an embolus set free in an omental vein could enter and travel up a gastric or a duodenal vein and cause a lesion in the wall of the stomach or the duodenum. To throw light on these questions a series of experiments was carried out on cats and rabbits, and the results of these investigations are given below. The number of the experiments carried out precludes the recording of them here in detailed form, consequently only so much description of experimental technique

PLATE I.



FIG. 1.—Hæmorrhagic erosions and small ulcers in the stomach of a rabbit, 2 days after ligature of  $\frac{3}{4}$  of its omentum.





and detail will be given as is deemed necessary for a proper understanding of the methods employed.

#### THE LIABILITY OF THE OMENTAL VEINS TO THROMBOSIS.

Experiments were carried out on a series of animals in the manner described below.

Under ether anaesthesia the abdomen was opened and the omentum was subjected to the following tests:—

- (a) To rough handling and rubbing with dry gauze.
- (b) To cold, from the evaporation of drops of ether.
- (c) To heat, by pouring hot saline of a temperature of from 50° to 60° C. over it, and by searing the fat alongside omental vessels with a hot platinum needle.

The animals were killed at intervals of two, three, and four days after such treatment, and in each case the omentum, the stomach, and the liver were carefully examined.

Ten animals, comprising one dog, six cats, and three rabbits, were used in these experiments. It was found that the delicate, thin-walled, and slenderly supported veins of the omentum, and particularly those of its fringes, were very susceptible to thrombosis. Thus rough handling produced in every case some thrombosis in the small venous radicles. In the heat and cold tests an immediate thrombosis, visible to the naked eye, was produced both in the venous radicles and in some of the larger veins. On the animals being killed some days later small hemorrhagic infarcts were found in the liver in five of the ten cases. These infarcts were examined microscopically, and in each case one or more thrombosed portal branches were found. The inference was that these minute infarcts were of embolic nature and were directly connected with the thrombosis of the omental veins. In only one case (a rabbit) was any definite gastric lesion found. In this case the stomach contained a little altered blood, and numerous well-marked hemorrhagic erosions of its mucous coat were present.

As a natural sequel to the experiments just described, the question as to what the tendency to portal embolism was in infective thrombosis of an omental vein now presented itself for investigation. Accordingly in three cats thrombosis of several omental veins was produced by searing the fat alongside the veins with a hot platinum needle. The thrombosed veins were

then punctured in several places with a fine needle which had been dipped in an emulsion of *staphylococcus aureus* in saline solution. One of the animals died two days later, and several well-marked infective infarcts were found in the liver. There had been no spreading septic phlebitis, the only pathological conditions found being the thrombosed omental vessels and the liver infarcts. The two other animals remained in good health, but were killed four or five days respectively after operation. In one of them small but quite distinct infarcts were found in the liver, and these microscopically were shown to be due to an infective embolus; in the other animal no evidence of embolism could be made out.

From these experiments I concluded that an aseptic thrombosis of the veins of the omentum may be readily induced by mechanical and thermal agencies, and that from such thrombosed veins emboli tend to separate in a considerable percentage of cases. These emboli entering the portal circulation are carried to the liver, and there cause small infarcts which heal readily, and, so far as can be made out, cause no disturbance in the general health of the animal. Occasionally one or more of these emboli would appear to be carried into the gastric circulation and to be responsible for the production of certain gastric lesions. Emboli appeared to separate more readily from a septic than from an aseptic thrombosed omental vein.

This peculiar liability to the liberation of emboli from the veins of the omentum is more readily understood when we realise how great are the periodic fluctuations in the portal circulation associated with the ingestion of food. After a meal the veins from the stomach are dilated to more than twice the size we usually see them in the fasting stomach. The veins of the omentum participate in this periodic dilatation and contraction.

#### RETROGRADE EMBOLISM OF GASTRIC VEINS.

The method adopted in order to test the possibility of retrograde venous embolism was as follows:—

The animal (cat) was anaesthetised and its abdomen opened with complete aseptic precautions; the margins of the abdominal wound were held widely apart by means of a spring retractor; the omentum was brought out and protected from chilling by warm moist swabs; a 1 c.c. sterilised record syringe, fitted with



PLATE II.

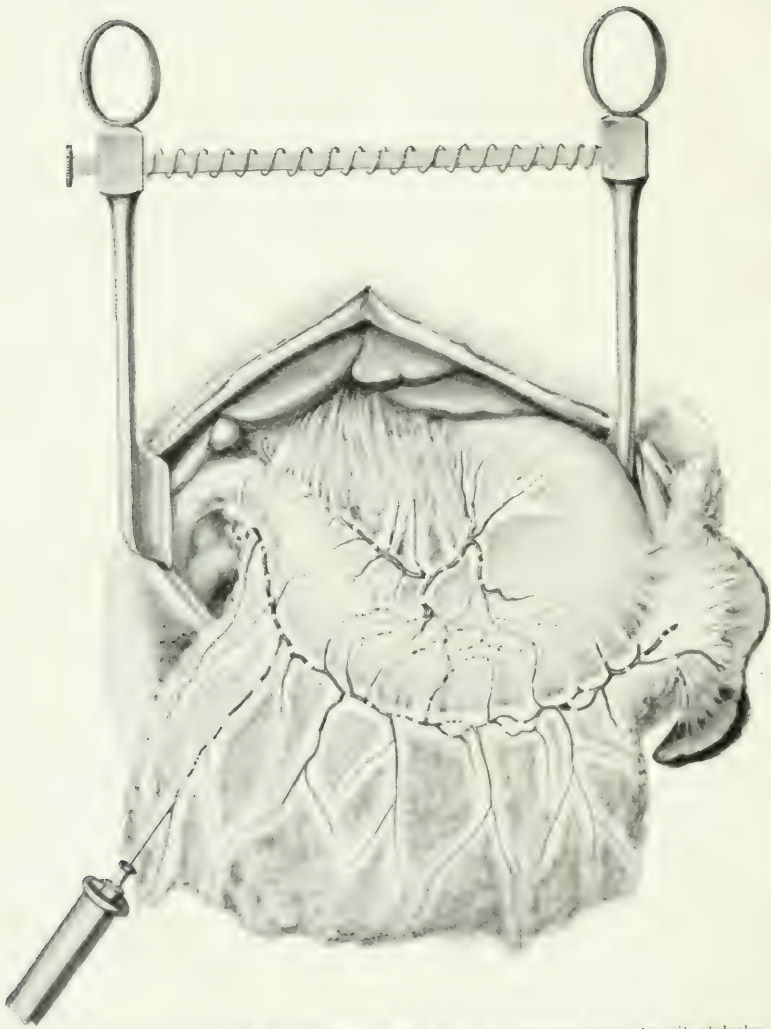


FIG. 2. Semi-diagrammatic sketch, showing the course sometimes taken by oil globules injected into an oriental vein of a cat. Note the oil globules traversing the network of veins in the stomach wall; also the inflex of the spleen.



a fine needle, was filled with sterile olive oil, and the needle was then introduced into an omental vein. A vein draining into the right gastro-epiploic vein was the one usually selected. The oil was then slowly injected; the viscosity of the oil and the very fine bore of the needle used, prevented a rapid or forcible injection. The oil globules were readily visible as they coursed along in the blood-stream. As a rule the oil globules on reaching the gastro-epiploic vein were carried to the right directly towards the portal vein. Not infrequently, however, if the animal held in its breath or coughed, or if it were somewhat collapsed and its circulation poor, the oil globules were seen to change their course and to travel either through the communicating branches between the right and left gastro-epiploic veins and so to reach the spleen, or to be carried up some of the lateral gastric branches, and, having traversed the fine anastomosis in the gastric wall, to enter the coronary vein at the lesser curvature or the gastro-splenic veins at the greater curvature of the stomach (see Fig. 2).

A very important fact was thus brought out, namely, that the course of the blood in the veins of the portal system may be altered by comparatively slight changes in the blood-pressure or in the respiratory movements, and that the blood returning from the omentum may, under certain circumstances, be diverted from its usual course and may traverse the gastric venous plexus, which thus comes to act as a filter for the omental blood. The low blood-pressure and the absence of valves in the portal vein and its tributaries favour this tendency to oscillation of the blood in the portal system.

In no case where the oil was carried through the gastric anastomosis did it appear to do any lasting harm, and when the animals were killed some days later the stomach in each case appeared to be normal.

#### GASTRIC LESIONS PRODUCED BY ARTIFICIAL EMBOLI FROM THE OMENTAL VEINS.

By introducing foreign bodies into the omental veins one hoped that, should some of them be carried in retrograde fashion up gastric veins, they might be entrapped in the anastomosis of fine branches in the gastric wall and produce gastric lesions. The experiments of Litthauer showed that the blood supply to one-third of the stomach may be ligatured without producing any necrosis of the gastric mucosa, so free is the vascular anastomosis.

If, however, embolism and thrombosis of the penultimate venous twigs of even a very small area of gastric mucosa could be produced, there was every reason to anticipate that necrosis and ulceration would follow.

In four cats an emulsion of a solution of thrombokinase\* in olive oil was injected into one or more of the omental veins. In every case some of the emulsion traversed the gastric anastomosis, but without producing any thrombosis or gastric lesion. In three cats a suspension of fine sterilised animal charcoal in olive oil was injected into an omental vein. In two of these animals retrograde embolism of gastric branches of the right gastro-epiploic vein occurred, and the fine black particles in the oil globules could be seen passing through the veins of the submucous plexus in the stomach wall. One of these animals, when killed five days later, showed a typical gastric ulcer on the anterior wall of the stomach near the greater curvature. The ulcer was roughly quadrilateral in outline, had rounded edges, and had an adherent slough in its base (see Fig. 3). On cutting the ulcer across two small veins in the submucosa could be seen plugged with charcoal granules. Microscopic sections revealed that the veins of the submucosa immediately subjacent to and for a short distance around the ulcer contained charcoal emboli and thrombi. There were numerous hemorrhages in the submucous coat, and the carbon particles which had escaped from the vessels were seen surrounded by very numerous polymorph leucocytes (see Fig. 4). In all three cats, infarcts were found in the liver and spleen, but the duodenum showed no pathological changes. In a series of similar experiments dermatol, as recommended by Payr,† was substituted for the animal charcoal. Dermatol is a bismuth preparation, a very fine yellow powder, which can be readily seen as it travels along in the blood-stream. In three cats a suspension of dermatol in saline solution was injected into an omental vein: in two of them no retrograde gastric flow was observed, but in the third animal a very definite embolism of two gastric branches running from the pyloric antrum

\* This was prepared by grinding up cats' testicles with saline in a mortar, allowing the solid matter to sediment over night, and then decanting off the supernatant fluid.

† Until this work was well advanced I was unaware that Payr<sup>6</sup> had carried out similar experiments, but in the later experiments full use was made of suggestions conveyed in his exhaustive papers on this subject. The results which I have obtained confirm, with a few exceptions, those which he has recorded.



FIG. 3. Gastric ulcer in a cat, 3 days after the injection of a suspension of animal charcoal in olive oil into an omental vein.

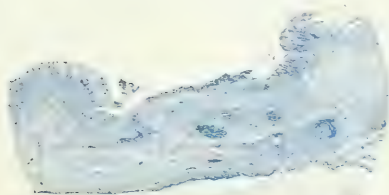


FIG. 4.—Very low-power view of ulcer (Fig. 3). Note several veins in the submucous coat plugged by charcoal emboli (deep blue).



FIG. 5. Gastric ulcer in a cat, killed 5 days after the injection of a suspension of burnt iron powder in saline into an omental vein.









into the gastro-epiploic vein was plainly visible, and on killing this cat two days later a gastric ulcer was found. The ulcer was situated in the pyloric antrum close to the greater curvature: it was of elongated oval outline, had a hyperemic margin and a greenish brown sloughy base (see Fig. 5). In situation it corresponded exactly to the dermatol-plugged vessels seen on the peritoneal aspects of the gastric wall. On microscopic section there was seen to be necrosis of the mucous membrane, considerable hæmorrhage into and œdema of the submucous coat, and embolism of the submucous veins by dermatol granules. The muscular coat was also thickened and œdematous, and the veins in the subperitoneal tissue contained dermatol (see Fig. 6). The other two cats showed no gastric lesions, but all three presented well-marked infarcts in the liver and spleen.

In a series of ten cats in which a suspension of dermatol in olive oil was injected into one or more of the ommental veins it was found that varying degrees of gastric embolism occurred in them all, under certain conditions. It was found that embolism occurred more readily in a large full-grown cat than in a young growing animal, and this was shown to be due to the presence of competent valves on most of the gastric tributaries of the epiploic veins of the young cat, whereas, though they may be present, such valves are generally incompetent in the full-grown animals.

It was also noted that if, owing to the presence of some food in the stomach or to any other cause, the animal tended to vomit, or if it became somewhat collapsed under the anæsthetic, the occurrence of gastric embolism was greatly favoured. Moreover it was observed that gastric embolism took place more readily towards the end of the injection, if but one were made, or in the later injections if several were made. Apparently, owing to the embolism of numerous portal branches in the liver by the oil and its suspended particles, a certain degree of stasis was induced in the portal system which favoured gastric embolism. There had also to be taken into consideration, however, the fact that in the later injections the animal had been for some time under the influence of a general anæsthetic, that its heart's action was less forcible, and its general blood-pressure lower than at the beginning of the operation. The results of the dermatol injections in these ten animals are summarised in Table I.

TABLE I.

Animal.	Injection of Dermatol in Olive Oil.	Visible Gastric Embolism.	Interval between Injection and Death of Animal.	Post-Mortem Findings.
(1) Cat.	Inj. into 3 om. veins.	Yes.	Killed 5 days later.	Infarcts in spleen; infarct in liver; stomach and duodenum normal.
(2) Cat.	Inj. into 2 om. veins.	Yes.	Died on following day.	Infarcts of spleen and liver; hæmorrhages in gastric and duodenal mucosa and into pancreas.
(3) Cat.	Inj. into 1 om. vein.	Yes.	Killed 10 days later.	Multiple liver infarcts; one infarct of spleen; numerous hæmorrhages in gastric mucosa. No ulcer.
(4) Cat.	Inj. into 2 veins at right hand border of om.	No.	Killed 8 days later.	Numerous liver infarcts; Spleen normal; stomach normal; areas of congestion of duodenal mucosa. micro. embolism of submuc. veins found.
(5) Cat.	Successful inj. into vein joining left gastric epiploic after numerous unsuccessful attempts in other veins.	Yes.	Killed 3 days later.	Numerous liver infarcts; <i>well-marked ulcer on greater curvature of stomach</i> , size of 3d. piece (see Fig. 7); spleen and pancreas normal.
(6) Cat.	Inj. into 1 om. vein.	Yes.	Killed 2 days later.	<i>Well-marked ulcer</i> , size of 6d., at centre of greater curvature on ant. wall of stomach; numerous hæmorrhagic erosions; multiple liver infarcts; duodenum normal (see Fig. 8).
(7) Cat.	Inj. into 1 tributary of right gastric epiploic vein.	Yes.	Killed 2 days later.	Multiple liver infarcts; infarct of spleen; numerous hyperæmic patches in stomach; <i>minute hæms. into duodenal mucosa</i> .
(8) Cat. (Young.)	Inj. into the vein at right hand border of om.	No.	Killed 3 days later.	A few hæm. erosions at cardiæ end of stomach; infarcts in liver and spleen; competent valves on gastric tributaries of epiploic veins.
(9) Cat.	Inj. into 2 veins, one at right border, the other in centre of om.	Yes.	Killed 6 days later.	Liver embolism; no gastric lesions.
(10) Rabbit.	Inj. into vein at centre of om.	Yes.	Died under anæsthetic 10 minutes after injection.	Hæmorrhages into submucous coat of stomach and thrombosis of submuc. veins.



PLATE I.







PLATE VI.



FIG. 8. Hemorrhagic enteritis and peritonitis in the stomach of a rat, 2 days after the injection of a suspension of *Shigella flexneri* into the peritoneal cavity. Note the hemorrhages into the pancreas and the intestine (the liver).



In another series of animals (four cats) 3 c.c. of weak thrombo-kinase solution were added to the suspension of dermatol in olive oil, and the mixture was injected into one or more omental veins. These experiments are summarised in Table II.

TABLE II.

Animal.	Injection of Dermatol and Thrombo-kinase in Olive Oil into Omental Veins.	Visible Gastric Embolism.	Interval between Injection and Death of Animal.	Post-Mortem Findings.
(1) Cat.	Inj. into vein at right hand bor- der of om.	Yes.	Died on follow- ing day.	Multiple liver infarcts; numerous hæm. erosions, and 5 <i>small ulcers</i> in pyloric antrum. Mul- tiple hæm. erosions in duodenum; hæms. into pancreas.
(2) Cat.	Inj. into vein at right hand bor- der of om.	Yes.	Died on follow- ing day.	Multiple hæm. infarcts of liver; infarcts of spleen; numerous hæm. erosions of stomach; infarction of upper $1\frac{1}{2}$ feet of small intestine; hæms. into pancreas.
(3) Cat.	Inj. into an omental vein joining a gastro- splenic vein.	Yes.	Appeared well for 2 days; died on 3rd day.	General peritonitis; lymph gluing om. and liver to ant. wall of stomach, where a <i>large ulcer</i> appeared to have leaked, but shut off with lymph; infarct of spleen (see Fig. 9). No infarct of liver.

From these experiments it is evident that not only is retrograde venous embolism of gastric veins by foreign bodies set free in omental veins a possibility, but that it may also be a fertile source of pathological lesions in the stomach, and to a less degree in the duodenum. Thus all grades of lesions, from small patches of hyperæmia up to large ulcers, were produced as the result of venous embolism.

It was found that the position of the omental vein chosen for the injection had a certain influence on the location of the gastric or duodenal embolism. Thus, as a rule, if the injection was made into a vein at the right hand border of the omentum the lesions were found in the pyloric half of the stomach or in the first two inches of the duodenum, whereas if the injection was made into a vein of the left half of the omentum the lesions were found in the cardiac portion of the stomach. There were several exceptions

to this rule, however, and the site of the gastric lesions seemed to depend more on the changes in the gastric circulation than on the point of introduction of the emboli into the omental circulation. Of considerable interest was the fact that in four cases embolism of pancreatic vessels and hæmorrhages into the pancreatic substance occurred.

#### HISTOLOGY OF GASTRIC AND DUODENAL LESIONS.

The histological appearances of the larger ulcers have already been briefly referred to: of greater interest, however, are the minute structural changes found in the minor lesions such as the hyperæmic areas, the mucous hæmorrhages and hæmorrhagic erosions.

The examination of hyperæmic patches revealed in several instances definite embolism of veins of the submucosa, with dilatation of the mucosa veins and minute hæmorrhages into the mucous membrane. Of particular interest were the sections from two hyperæmic patches in the duodenum in cat (4), Table I. In this case emboli had been introduced into a vein at the right hand border of the omentum, but no embolism of gastric veins had been seen to occur. On killing the animal eight days later there were no gastric lesions, and but two small hyperæmic areas in the duodenum,  $\frac{1}{2}$ -inch beyond the pylorus, were found. Microscopically these areas were found exactly to over-lie two thrombosed veins containing dermatol emboli in the submucous coat. At the post-mortem one could clearly demonstrate that owing to the presence of competent valves on the gastric veins no retrograde embolism of these could have occurred. In the sections from areas of mucous hæmorrhage definite thrombosis and embolism of the submucous and, though less frequently, of the mucous veins were seen. Payr has shown that when finer powders, such as Chinese ink, are used as emboli, the lesions are most pronounced in the vessels of the mucous membrane, and this observation I have confirmed.

Sections of the areas of hæmorrhagic erosion showed thrombosis and embolism of submucous veins, hæmorrhage chiefly in the submucous tissue, and commencing necrosis of the mucous membrane. Payr holds that such erosions in the region of the pylorus in the human subject frequently cause pyloric spasm with its associated symptoms.

PLATE VII.



FIG. 3. Gastric ulcer in a cat, 3 days after the injection of an emulsion of dermatol and thrombokinas in olive oil into an omental vein. The animal died from general peritonitis, the result of a leak through the necrotic base of the ulcer.





## EFFECT OF EMBOLI FROM MESENTERIC VEINS.

In order to test whether an embolus from a mesenteric vein might reach the stomach by retrograde flow and cause a gastric lesion an emulsion of dermatol powder in sterile olive oil was injected into a mesenteric vein of a cat. During the injection a careful watch was kept on the gastric veins for the appearance of any of the yellow powder, and two days later the animal was killed and the stomach and duodenum carefully examined. This experiment was repeated on seven cats, but in no case was there the least evidence of a retrograde gastric or duodenal embolus, even though in two cases the animal was violently sick during the injection, and though in one case the injection was continued until the portal branches in the liver were all occluded by the emboli and complete portal stasis resulted. These results do not coincide with those of Payr, who found gastric lesions in three out of seven cases where a similar injection had been given.

## CONCLUSIONS.

From the results of these experiments certain conclusions may be drawn with confidence:

(1) Thrombosis of veins of the omentum is readily produced by mechanical, thermal, and bacterial agencies.

(2) From thrombosed omental veins emboli may frequently separate, probably owing to the periodic vasodilatation and contraction associated with the ingestion of food.

(3) Emboli from veins in the omentum may, under certain circumstances, be carried up gastric veins and become impacted in the venous plexus of the submucous coat of the stomach, and determine a gastric ulcer.

Beyond this it is impossible to go at present, but these experimental results prompt certain suggestions in regard to the etiology of gastric and duodenal ulcers in the human subject which can only be decided by prolonged and extensive clinical investigation. These suggestions are:—

(1) That the hæmatemesis sometimes met with in cases of acute appendicitis is due to an acute gastric ulcer resulting from blockage of a gastric vein by a septic embolus from a thrombosed omental vein.

(2) That on similar lines the omental vessels may form the connecting link in the association of chronic gastric or duodenal ulcer with an inflammatory process in the lower abdomen. One

might even go further and suggest that the relatively greater frequency of duodenal ulcer in the male is directly associated with his greater liability to appendical trouble and consequent involvement of the right border of the omentum, whilst the relatively greater frequency of ulceration of the body of the stomach in the female is associated with her exposure to pelvic inflammatory trouble which may occur on either side and may involve any portion of the omentum.

The ulcers which were produced experimentally were of the acute type, and they tended to heal up readily, for the animals used were healthy, and lacked the very important factors which appear to determine the chronicity of gastric ulcers in the human subject, namely, the general irritability of the gastric mucosa and the altered secretory function of the gastric glands.

(3) The occurrence of embolism of veins in the pancreas, followed by hæmorrhages into the pancreatic tissue, after the injection of artificial emboli into omental veins, suggests the possibility of portal embolism playing a part in the etiology of some cases of acute pancreatitis.

REFERENCES.—<sup>1</sup> Von Eiselsberg, *Archiv. f. klin. Chir.*, Bd. lix.   <sup>2</sup> Friedrich, *Archiv. f. klin. Chir.*, Bd. lxi.   <sup>3</sup> Engelhardt u. Neck, *Deutsch. Zeitschr. f. Chir.*, Bd. lviii.   <sup>4</sup> Payr, *Münch. med. Wochenschr.*, 1905.   <sup>5</sup> Paterson, *Lancet*, 14th January 1911.   <sup>6</sup> Payr, *Archiv. f. klin. Chir.*, Bd. lxxxiv.

SOME INTERESTING CASES OF TROPICAL DISEASES  
SEEN IN EDINBURGH DURING 1910.

By MAJOR D. G. MARSHALL, I.M.S.,

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THE cases during the year were very numerous, and, owing to their varied nature, covered a great portion of the field of tropical medicine. They were drawn from many sources—the different dispensaries and hospitals of Edinburgh, the shipping at Leith, and the military hospitals; in addition the students from various parts of the tropics attending the University afforded many cases.

**Malaria.**—Benign tertian was the most usual type, but several cases of subtertian or malignant and one of quartan were admitted.

The Royal Scots and two batteries of the Royal Field Artillery returned from India to Edinburgh recently; many of the men suffered from malarial relapses and other tropical affections. By the courtesy of the senior medical officer at the Castle every facility was afforded of utilising these cases for teaching purposes, even to the extent of holding clinics in the wards of the Castle Hospital.

Some of the cases presented points of interest. One was a man from India, who had been told on arrival in this country that the fever from which he was suffering at irregular intervals could not be malaria since it was not checked by quinine. He was therefore advised to discontinue the daily dose of quinine which he had been accustomed to take as a prophylactic. He came to Edinburgh soon afterwards, and as the result of a chill developed a severe attack of typical malaria, the blood showing numerous benign tertian parasites. The condition yielded rapidly to large doses of quinine.

In association with Dr. Gunn, trials were made with a new therapeutic agent in the treatment of malaria, viz. harmaline,<sup>1</sup> an alkaloid prepared from the seeds of *Peganum harmala*, the "wild rue" of the ancient Greeks. Though laboratory experiments have shown that the pharmacological action of this alkaloid is practically identical with that of quinine, it had not, so far as we were able to ascertain, previously been administered to man, and we had some little difficulty in ascertaining the effective dose.

<sup>1</sup> Gunn, *Trans. Roy. Soc. Edin.*, vol. xlvii. pt. ii. No. 11.

The number of cases in which the alkaloid was used was too small to enable us to form any definite conclusions, but the results so far obtained have been satisfactory. Harmaline possesses some advantages over quinine: for instance it is practically tasteless, the dose is small, and further experience may prove it to be a serious rival to the older remedy.

It is a well-recognised principle that in the diagnosis and treatment of patients from malarious countries the probability of an underlying malarial taint should always be kept in view: several cases showing the value of this line of thought have come under observation. On the other hand, it should be recognised that although a person from a malarious country suffers from attacks of fever with a hot and cold stage, the disease is not necessarily malaria. To avoid mistakes in diagnosis a thorough examination of the blood is necessary—not simply examination of a stained film, but a total and differential count of the leucocytes.

It does not appear to be well known at home that syphilis in a person who has previously suffered from malaria is often associated, in both the earlier and later stages, with irregular attacks of fever.

Many cases are on record of mistaken diagnosis of liver abscess and other affections corrected on operation by the discovery of gummata in various regions. Hence syphilis should always be borne in mind in cases of fever presenting difficulty in diagnosis.

The following case is a good illustration:—A patient who had spent some years in the tropics was admitted, said to be suffering from acute malaria. He had daily attacks of fever (Fig. 1) with well-marked hot and cold stages. Although malarial parasites could not be found in the peripheral blood he was treated with large doses of quinine, with absolutely no effect. By an exhaustive examination of the blood I was able to exclude any known form of tropical fever, and learning that there was a history of syphilitic infection ten years before, suggested that the condition was probably due to a specific lesion. A Wassermann reaction was positive; this, of course, did not prove the case to be syphilitic, but the effect of treatment with iodide of potassium and mercury was most marked. Within three days the temperature fell to below normal and remained there, except for a few days, when the mercury had to be discontinued owing to soreness in the mouth. When seen a month later the patient appeared in perfect health, and had gained 24 lbs. in weight.



**Filarial Fever.**—The irregular attacks of fever so often associated with the earlier stages of filarial affection are often mistaken for malaria, and as the disease is so widely spread, this fact deserves to be more fully recognised. Two cases of this kind were seen recently, one from the West Indies, the other from Lower Bengal. In both the discovery of the *Microfilaria Bancrofti* cleared up the diagnosis.

**Pneumonia.**—In malarious countries it is important, especially at the approach of the cold weather, to avoid overlooking early cases of pneumonia. The disease is often of an irregular type and is apt to be carelessly diagnosed as malaria; besides, a pneumonia of a severe type may be associated with a diminution in the leucocytes. As a rule a diagnosis of malaria may be excluded by a differential count showing a small proportion of large mononuclears. A case of this nature came under notice, a man, recently home from India, with a large spleen and high temperature. Bearing the above in mind we were able to make an early diagnosis of pneumonia.

**Blackwater Fever.**—A case occurred in 1909 and was fully reported in 1910.<sup>1</sup> It presented many points of unusual interest.

**Leprosy.**—One case was admitted, and is still under observation. It is of the maculo-anæsthetic type in a very early stage. The patient, a girl 10 years of age, was born in British Guiana of European parents. The disease manifested itself, or was first noticed, nine months ago, the earliest sign being an eruption on the sole of the right foot.

In the history it is recorded that the patient returned from British Guiana four years ago apparently quite well, but some time before leaving for home her family received a visit from a nurse who was suffering from leprosy. With this person the child was a special favourite, and they were constantly in close contact.

On examination a well-marked prominent macular eruption was seen on the forearms, body, and lower extremities. In the centre of the patches there was complete loss of sensation, altered sensibility extending beyond the area of eruption. No thickening of the ulnar nerve or wasting of the interossei in the hands was noticed. Examination of scrapings of different points of the eruption and the various secretions failed to record the presence of the leprosy bacillus.

The patient is being kept under close observation, and it is

<sup>1</sup> *The Lancet*, 14th May 1910, p. 1333.

noted that some benefit appears to have been derived from the administration of mercury.

**Beri-Beri.**—In December 1910 I was able, by the kindness of Dr. Robertson, Medical Officer of Health for Leith, to visit a steamer from Singapore, on which I found six of the Chinese crew suffering from beri-beri. They were removed to the Royal Infirmary, and remained there for a month.

None of the men could speak or understand English, but fortunately a Chinese student attending the University understood their particular dialect, and we were thus enabled to gain full particulars concerning them.

All the cases were marked by absence of the patellar reflex and other signs of peripheral neuritis, while three suffered from cardiac symptoms associated with dilatation of the heart.

Examination of the blood for organisms, including the cultivation of 10 c.c. drawn from the basilic vein in some of the cases, was negative, excepting that owing to the presence of intestinal parasites there was a marked eosinophilia in four of the cases, the highest being 31 per cent. There was no sign of anamia, the average of red cells being 4,991,000, haemoglobin 98 per cent. It has been stated by certain writers that beri-beri is associated with an increase in the small lymphocytes up to 40 to 50 per cent. This was not the condition in these cases, the lymphocytes varying between 17 and 36 per cent., average 26.

A supply of the "uncured" rice, which formed the staple diet of the Chinese crew, was obtained from the ship: with this feeding experiments on fowls are being conducted.

Examination of the stools revealed, as is generally the case in Chinamen, the presence of ova of various parasites. Five of the six patients were found to be infected.

The ova found were, in order of frequency:—(1) *Ascaris lumbricoides*; (2) *Trichocephalus dispar*; (3) *Ankylostoma duodenale*; (4) *Schistosomum japonicum*.

One case showed all four, another (1), (2) and (3), while of the remainder one showed (1) and (2), the others only (2) and (3).

In one of the cases some of the ova of *Schistosomum japonicum* showed a small blunt spine or knob at one pole, but not quite terminally placed.

Since this description was written, a note by Leiper has appeared (*Trans. of the Soc. of Trop. Med.*, March 1911) on the presence of a lateral spine in the eggs of the *Schistosoma japonicum*, describing "a curious little nipple-like knob or spine situated

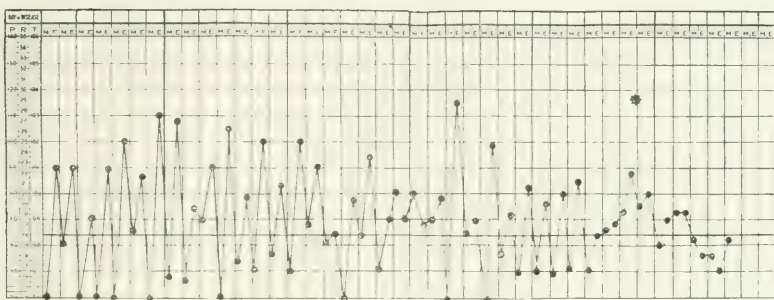


FIG. 1.—Temperature chart of a case of syphilis simulating malaria. The star marks the day on which specific treatment was begun.

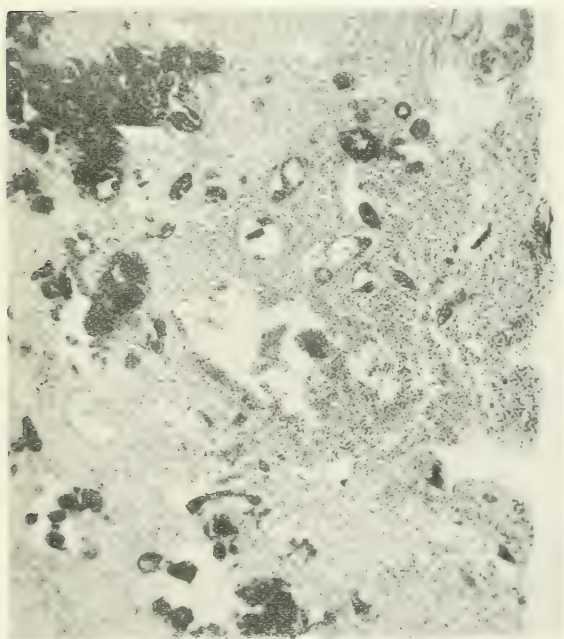


FIG. 2. Section of bladder wall from a case of bilharziosis. Showing many ova and erosion of the mucous membrane.





a short distance from one of the poles of the egg." It is interesting to note how closely the two descriptions tally, and how soon Leiper's observations have received independent corroboration.

**Metazoal Infections.**—In addition to the infections found in the cases of beri-beri, a very varied selection of parasitic diseases has been under treatment, including conditions associated with the presence of bilharzia, filaria loa (Calabar swellings), filaria perstans, and filaria nocturna.

*Bilharziosis.*—Owing to the large number of Scottish soldiers who became infected during the South African War, and who unfortunately are still, after a period of ten years, showing signs of the affection, cases of this disease are always available for teaching purposes. In addition, some of our Egyptian and South African students are also found to be affected.

As a result of the experience thus gained, one point, at least, as laid down in the text-books is proved incorrect, viz. that it is necessary to dilute the urine freely to cause hatching of the miracidia. It is regularly done without the addition of water by the residents in the wards, and I have found frequently, and shown to students of my class, miracidia hatched out in a bottle of urine, of normal specific gravity, kept at room temperature. This is an important fact in the view of the statement that auto-infection is possible in old-standing cases.

One case of ten years' duration terminated in death from heart disease; on post-mortem examination careful search of the vessels of the portal system failed to show any adult worms. The examination of the liver was also negative. The condition of the bladder was interesting (Fig. 2). On passing the finger over the inner surface at the base a distinct "gritty" feeling was experienced. On section this was found to be due to collections of enormous numbers of ova which, as may be seen in the illustration, had produced erosion of the mucous membrane.

**TREATMENT.**—The condition of the patients is improved by careful regulation of the diet and general conditions of life, but unfortunately no medical treatment appears to be of much benefit. Even the atoxyl group, tried for different periods and by different methods in several cases, has not produced any satisfactory result. Turpentine and filix mas appear to have a soothing effect on the bladder. One case was complicated by the formation of a stone in the bladder, followed by another in the right kidney; these were removed by operation.

*Filariasis.*—Cases of this nature have been numerous, and

presented many interesting features. One was of a most unusual nature. A missionary from the Congo was found to be harbouring *filaria perstans*, and from the abdominal wall of his wife a living adult loa was removed by incision.

In the case of the husband the embryos were very scanty, and could only be found by using Ross' method of thick films, about 50 per cent. of the films being negative, the others containing one or at most two embryos. The wife had frequently suffered from Calabar swellings, and an adult worm had occasionally been seen moving in the subcutaneous tissues; arrangements were made by which, as noted above, it was on its next appearance quickly removed. Another lady missionary is at present under treatment suffering from marked Calabar swellings, and a student of the class of Tropical Medicine also showed the condition. Careful and repeated examination of the blood in all the cases that have come under notice has failed to reveal the presence of the *filaria diurna*; the degree of eosinophilia in the cases has varied from 67 per cent. in a case three years ago to 8 per cent. in the patient from whom the adult worm was removed.

**FILARIA BANCROFTI.**—In the case of a student from the West Indies the only symptom complained of was irregular attacks of fever. In another from Lower Bengal there was a history of repeated attacks of fever during the last few months, and also that about a year ago in an operation for radical cure of hydrocele the fluid was found to be of a "milky" appearance and had been examined for *filaria*, with a negative result. In both cases between 10 P.M. and 2 A.M. numerous embryos were found in the blood. In still another case from the West Indies, with enlarged inguinal glands from which clear serous fluid was exuding, examination of the blood and the fluid from the glands was negative.

A practical hint may be given regarding the methods to be adopted for the detection of microfilariae in the blood. If very scanty in number, as is often the case with *filaria perstans*, Ross' thick film method must be used, but when fairly numerous an ordinary film stained by Leishman's method suffices. In this case it is useless wasting time examining the body of the film, as the microfilariae are seldom to be found except at the margins or at the end where the pressure of the needle or other agent used for spreading the film has terminated. From want of knowledge of this simple point I have often known slides classed as "negative" by students and others in which examination of the edges or the end of the film showed numerous embryos.

**Abdominal Affections.**—*Sprue.*—Several cases tended to prove that the symptoms of this disease are sometimes so insidious and misleading that its existence is overlooked by men at home, and that the importance of frequent examination of the stools as a means of diagnosis is not fully appreciated.

The routine treatment adopted and followed by satisfactory results was strict rest in bed, with milk diet gradually supplemented until ordinary diet was reached. For many years I have been in the habit of prescribing for this disorder an article of food which is much appreciated by the patients and has produced good results, namely, porridge made from freshly ground oat flour. Grapes, stewed apples, and other fruits were freely given, and the administration of large doses of the essential oils, especially cinnamon and cajuput, gave satisfactory results.

**Dysentery.**—The cases of dysentery were all of a chronic nature; relief was generally afforded by large doses of ipecacuanha administered in the form of pills coated with gelatine to which a small proportion of formalin had been added. By this means it was found possible to give doses of 15 to 20 grs. for several consecutive nights without producing nausea or vomiting.

In one case it was considered advisable to perform appendicostomy in order to secure efficient lavage of the colon. This case is still under treatment.

**Liver Abscess.**—Two cases were seen; in both the abscess had ruptured through the right lung. One ended fatally in spite of operation, the other apparently recovered after the administration of large doses of ipecacuanha.

On a post-mortem examination of the fatal case it was easy to see how difficult or almost impossible it is to reach, by operation, the abscess cavity in the liver in a case of some duration, where the abscess had burst through the lung. There was a large abscess in the lung, but the cavity in the liver, found only after a careful dissection, was about the size of a small walnut. The *entamoeba histolytica* was found in sections of the wall of this cavity, and also in the sputum of the other case, thus confirming the diagnosis in both cases.

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OUTBREAK OF TYPHUS FEVER IN THE CITY OF  
CARLISLE.

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Medical Officer of Health.

On 5th April 1909 I was asked by a young practitioner to see two suspected cases of scarlet fever in a single-room tenement in one of the courts within this city. Upon visiting the house I found two young women, aged 17 and 15 years respectively, suffering from typhus fever. They were removed to the Isolation Hospital at once, the room cleansed and limewashed, the bedding and clothing destroyed, and the furniture washed with a strong disinfectant solution.

Upon investigating the cases I discovered that the grandmother of these two girls, an old woman aged 67, who had been bedridden for some time, had died in the same room, and was buried on 18th March. On looking up the certified cause of her death I found that it was stated that she had died from bronchitis, heart disease, and exhaustion.

At the time of the death of the old woman, and for some months previously, this tenement room had been furnished with two large beds, which were occupied by the old woman, her son, and two granddaughters, making in all four. The two girls before mentioned became ill on the 30th and 31st of March respectively, *i.e.* twelve and thirteen days from the date of the burial of the old woman, during which time they had occupied the bed which the old woman had occupied up to her death.

On making further inquiries respecting persons likely to have been in contact with the two girls and with the deceased woman I obtained the names of a number of people, who were afterwards visited daily for fifteen days, but amongst whom no outbreak of the disease occurred. On 14th April, in consequence of certain information obtained by the sanitary inspector, he visited two houses in a street in the same area of the city, at one of which he found the father, aged 40, the mother, aged 40, and a daughter aged 12 years, and at the other a female, aged 10, all suffering from severe headaches and extreme prostration.

Inquiring further, the inspector discovered that the woman had been in contact with the old woman before mentioned. He reported the cases to me at once, and upon visiting the two houses I found that all four persons were suffering from typhus fever.



After the removal of these four cases to hospital the rooms and furniture were cleansed and disinfected as in the previous instance, and the bedding and clothing destroyed. We had not previously been informed of this woman having been in contact with the old woman who died, but we now discovered that she had sat up with her prior to her death, and had laid her out after death, and had also lent the two infected girls bed sheets to lay out the corpse pending the arrival of the coffin. These sheets were returned the day after the funeral of the old woman, and were stated to have been washed and boiled immediately on being brought back, but they had not been washed before removal from the infected house.

The second little girl mentioned was a school-fellow and play-mate of the other little one, and, living in the same street, spent much time after school and at meal times in their house, and from the clinical history of the case would appear to have been infected about the same time as the man and his daughter.

The woman, in addition to suffering from the acute effects of the fever, was from seven to eight months advanced in pregnancy, with somewhat trying nervous symptoms, which made it difficult to obtain anything in the nature of an accurate account as to when she first felt ill.

The history would tend to show that these four cases might have been infected about the same period, but the records showed that the temperature of the woman and her child fell to normal on the seventh day after admission to hospital, that of the other child fell to normal on the tenth day, whilst that of the man remained fairly high till the tenth day, when it exhibited signs of hyperpyrexia, and he died.

Both the man and the woman stated that the sheets were the only things lent to the two girls, and that they were immediately washed and boiled after being sent home, but the suspicion of infection must fall either upon the bed sheets, or the woman became infected during her visits to the old person, and was later the means of infecting her husband, her child, the neighbour's child, and subsequently her niece. The latter view I think is the more likely, and it is reasonable to assume that owing to the pregnant condition of the woman the disease might be capable of exhibiting aberrant features.

On 10th May I received information of a suspicious case of illness in another court, which upon visiting I found to be a case of typhus fever in a young married woman who, with her husband,

occupied a single-room tenement in a more or less open court leading from one of the main streets in the same infected area as that in which the previous six cases had occurred. She was immediately isolated, and the house and bedding, &c., treated as in the previous cases. This woman was a niece by marriage of the female adult mentioned previously, and had undoubtedly been in contact with that family immediately before their removal to hospital. There was also strong suspicion of bed-clothing having been lent by the woman to her niece, this, however, both parties denied.

At a later stage a housemaid attached to the administrative portion of the Isolation Hospital developed the disease, no doubt through clandestine visits paid by her and by her stupidity in conversing with a typhus patient at the window of one of the wards.

The court in which the tenement is situated where the first two cases were discovered is a well court, reached by a long narrow passage running beneath shop property; it is practically in the centre of the city, and the property consists of two closely approximated blocks of dwellings, mostly single tenements. The tenement in which the outbreak occurred is at the far end of the court, and is one of four rooms crowded together and reached by a wooden staircase, at the top of which is a small dark landing on to which the doors of the four tenements open.

The street in which the four cases occurred is situated at the south side of the city; it is a moderately wide street, the houses being of the type known as "back to back," and three hundred yards distant from the previously mentioned court, both being distant from half to three quarters of a mile from any of the centres of the previous outbreak of typhus fever which have from time to time occurred within the city.

I was unable to trace the source of infection of the two girls, *i.e.* assuming that the old woman did not die of typhus fever; yet both girls swore that they were never away from home, except that one was engaged as day-maid with a good family in Carlisle from 8 A.M. to 8 P.M. each day and slept at home, the other being employed at a textile factory in the city, working with new cotton stuff. No suspicion fell upon any other worker in the factory, and as nothing but new cotton is used in the manufacturing process I attached no suspicion to the factory as a source of infection.

The people living in the first infected house were poor, and the two girls out of their earnings had, in addition to keeping

themselves and paying the rent, to support the aged grandmother and the uncle.

Nothing had been brought into the house in the nature of old clothes, and no one visited the house so far as one could ascertain who would be likely to import the disease.

Regarding the second family infected, it was impossible to trace anything likely to cause infection other than the visits of the woman or the bed-clothes which were lent, and it is important to mention that she did not visit the house after laying out the old woman, on account of a quarrel about money matters.

The old woman was said to have been bedridden for some months before her death, and the only outside visitors were the neighbours, therefore, so far as could be ascertained, no one visited her who would be at all likely to have imported the disease into the house.

The questions which arose were:—(a) Did the old woman die of typhus fever, and did she infect the two granddaughters? or (b) Were the two granddaughters the first and only cases of typhus fever in the house?

If the latter were the true explanation of affairs, how did they become infected? To this question I have no further answer, seeing that I was unable to obtain the faintest evidence of outside infection, either by means of contact, third person, or fomites.

I was therefore forced to the conclusion that the old woman died of typhus fever, and that she infected the two girls. This opinion is supported by the fact that the adult female of the second family infected, who had not been to the house or had any other communication with the girls after laying out the old woman, developed the disease, and presumably infected her daughter, a neighbour, in all probability her niece, and her husband, in whom the disease, unfortunately, proved fatal.

The almost complete disappearance of typhus fever may be said to be one of the triumphs of modern sanitation and public health measures, for at the present time the disease is seldom met with except in a few centres in Great Britain, Ireland, and on the Continent.

Sporadic cases, however, do appear from time to time, and every few years limited outbreaks are still met with in districts which have formerly been the scene of epidemics of the disease. Yet, curiously enough, as pointed out by Osler, the remarkable present-

day feature of the disease is the occurrence of a few cases at long intervals of time, and at great distances from known foci of the disease, this being probably one of the points which led Murchison to favour the theory that the disease might be capable of spontaneous origin.

Carlisle being a very old city with a large percentage of single-room, court, and back-to-back tenement property, and a large favourably placed element of its population occupying this class of property, little surprise can be felt that the disease should from time to time make its appearance or crop up as a legacy of former epidemics.

I have mentioned elsewhere the difficulty experienced in dealing with early cases of this disease owing to the fact that so few of the present generation of medical practitioners have had opportunities of studying it. Thus the earlier cases are missed, either as a result of the clinical manifestations being attributed to other causes, or the deaths ascribed to purely symptomatic features, and I am of the opinion that the old woman mentioned above died of typhus fever, but that partly at least through medical assistance not having been obtained until just before death. The disease was, as the practitioner who attended her said, marked by the immediate signs of approaching death.

In a previous outbreak in Carlisle, which commenced in April 1905, the first two cases were not diagnosed until received into the Isolation Hospital, when they were observed to be suffering from typhus fever, but had been notified as suffering from enteric fever, and were contacts from two other cases also notified as enteric fever, which turned out to be actually typhus, the origin of which could not be traced.

It would appear that Carlisle from time to time has suffered somewhat severely from the ravages of this disease. Upon making investigations into epidemic diseases in this city, evidence of the widespread outbreaks of typhus fever is not wanting, the occurrence of which lends weight to the suspicion that the earliest outbreaks were probably not altogether unassociated with the immigration of Irish people into Carlisle.

Between April and October 1905 sixteen cases of undoubted typhus fever occurred, practically all in a circumscribed area of nine streets, and traceable, in the first instance, to contacts of the two cases previously mentioned as having been notified as enteric fever. The incidence in relation to occupation was as follows:—Telegraph messenger, 1; telegraphist, 1; labourer at a nursery, 1;



biscuit factory hand, 2; hawker, 1; housewife, 3; painter, 1; sweet factory hand, 1; school child, 5.

During the same period three cases of typhus fever occurred in the adjacent rural district, which were contacts from one of the above cases.

My predecessor, the late Dr. Brown, in a note upon this and other outbreaks, says that since 1874 the early case or cases have always been mistaken for enteric fever.

The outbreak of April 1909, however, furnishes a somewhat different example, for the two cases when first seen by me would, if taken casually, have been mistaken for severe measles or scarlet fever, and it will be remembered that it was in respect of the latter disease that I was asked to see them.

It would be of interest to mention some of the previous outbreaks which have occurred since the present Carlisle Sanitary Authority was formed in 1874, during which year typhus fever was prevalent in the city in epidemic proportion.

Sir W. H. Power, then Mr. Power, afterwards Principal Medical Officer to the Local Government Board, in 1874 made a special medical inspection of this city, and after an analysis of certain statistical records estimated that from April of that year, when typhus began, to the end of September of the same year, there had been 680 cases of the disease, out of which number 68 proved fatal. This outbreak, which terminated in 1876, is said to have resulted in no fewer than 144 deaths from the disease, out of a total of 1440 cases computed to have occurred during the same period.

From 1876 to 1885, a period of nine years, Carlisle appears to have been free from typhus fever, but in the latter year the disease made its appearance in a house in Rigg Street, from which it spread by contact to adjacent houses, resulting in seven persons being affected. Two years later another outbreak occurred, which gave rise to eleven cases, followed in 1892 by a further outbreak resulting in sixteen cases, succeeded by the outbreak mentioned in 1905, and lastly, the eight cases mentioned as forming the first part of this article.

In some further observations upon the disease Dr. Brown says: "As to whether typhus fever originates spontaneously or from some pre-existing case has always been a matter of dispute. There are several circumstances in connection with Carlisle outbreaks which favour the *de novo* theory of origin. (1) In none of the various outbreaks in Carlisle for the last thirty-one years has its

origin from any pre-existing case been traced satisfactorily. (2) All the outbreaks have commenced in a limited area occupied by old house property in the Caldewgate district and a similar kind of property in adjacent districts situate in the immediate vicinity of Castle Street. (3) All the outbreaks have commenced in the early part of the year, and, with one exception, about the same month, viz. the month of April, and it is curious to note that this April occurrence attended a great epidemic of typhus fever in Carlisle in 1781, graphically described by the late Dr. Heysham, when some 600 persons were attacked, representing one in eleven of the then population of the city. (4) The Irish element of the population has always been the first invaded." Dr. Brown almost closes the portals of attack upon his theory of a *de novo* origin by stating that "these facts tend to show that for the production of typhus fever local conditions, race characteristics, and seasonal influence are factors of importance, and that some of these points have more than a speculative interest."

I have no intention of discussing the diagnosis of the disease, seeing that all text-books deal with the diagnosis, both actual and differential, by far the most important point in public health administration being its mode of transmission.

That typhus fever passes directly from the sick person to the healthy is established by the clearest possible evidence, such instances having been observed in hospitals into which typhus fever cases are admitted, and also where cases have been left in private houses or lodgings the disease passes not only to relations and other inhabitants of the same dwelling, but to doctors and clergymen whose contact may be said to be occasional.

With regard to the specific cause of the disease we may be said to be very little in advance of the days of Murchison; yet the cycle of changes brought about by research, and the rapid strides made by the preventive branch of modern medicine, have narrowed down the possible sources, so that at the present time, although the causal organism in this disease is still unknown, our modern knowledge and conception of the nature of the acute infections generally lead to the belief that the time is not far distant when the knowledge of its etiology will be an accomplished fact.

Fortunately and unfortunately the opportunities for studying the disease, both clinically and bacteriologically, become fewer and fewer, but modern views as to its spread become more and more reasonable.

Fagge and Pye Smith suggested that the poison gained entrance to the body by the breath, and successively invaded the lymph and blood streams, and it is doubtful if anyone would be bold enough to assert that typhus fever is not transmitted in this manner.

The theories (and views) as to the spread of the disease by fomites in this as in many other infectious diseases die hard, but this, in view of the most recent theories as to the mode of infection in typhus, is a circumstance not altogether undesirable.

Fagge and Pye Smith say that it is at any rate certain that clothes and bedding may become vehicles for the transmission of typhus; and Barker and Cheyne relate the incident where a child discharged from a fever hospital took to another institution a bundle of clothes which had not been disinfected, and that the woman who opened the bundle perceived an exceedingly disagreeable odour, and in a few minutes became ill with what proved to be the beginning of the fever.

The latter observers were presumably alluding to an incident which occurred in earlier days when smells were thought to be capable of setting up a number of diseases, but who amongst those engaged in the practice of medicine has not observed the intolerable odours which emanate from the bodies and clothing of dirty persons, yet who, in view of the light thrown on diphtheria and enteric fever, would assert that smells are the exciting cause of disease, at the same time who would attempt to disprove that in the bundle of clothes mentioned there might not be present a collection of dangerous body vermin.

Writers have said that very few positive instances seem to have been recorded of the communication of typhus by contact with the bodies of those who have died of it, yet Murchison, who was attacked in Edinburgh, had been dissecting in a close room in which there were many bodies of persons who had died from typhus fever, had not entered the wards of the Infirmary, nor seen a case of the disease; and the writer himself has seen a number of cases of typhus fever in persons who have been present at the holding of a wake.

Writing further, Fagge and Pye Smith say: "It appears that typhus is seldom conveyed by persons not themselves infected, but Murchison relates that in January 1867 a patient in a surgical ward at the Middlesex Hospital sickened with typhus fever after being in the hospital for three and a half months from some other

disease, but who had been receiving daily visits from a nurse who was in close attendance on a typhus patient downstairs.

Murchison endeavoured to prove that typhus, instead of always being due to contagion from a previous case, might be generated *de novo* in persons placed under defective conditions, of which overcrowding is the chief; but in attempting to establish this mode of origin of the disease we must first disprove—(1) That overcrowding of itself has never been shown to be capable of giving rise to the disease. (2) That the outbreaks of the disease cease when the affected persons are isolated and disinfection carried out. (3) That when the disease crops up the persons affected are not necessarily more poverty stricken, overcrowded, or dirty than hundreds of others of the same class amongst whom the disease, as far as history records, has never occurred.

Coming to recent considerations which have been given to the question of typhus infection arising out of a comparison of certain of its features with diseases not dependent upon contact, filth, poverty, or overcrowding, one is led to the question of the part played by insects, and in this particular disease the possibility of infection by the common varieties of body vermin.

Professor Matthew Hay of Aberdeen, in a report to the Local Government Board of Scotland upon an outbreak of typhus fever in Aberdeen (*inter alia*), says, "that at the beginning of the epidemic only one member (a nurse) of the hospital and sanitary staff had previously had typhus, and that out of the members of the staff, in all forty-six, some of whom were in intimate daily contact with the disease for three to four months, only one nurse, one ward-maid, and one ambulance driver were affected during the first eight weeks of the epidemic."

In discussing some interesting points regarding the distribution of attack among the staff, Professor Hay points out that no nurse or ward-maid in the convalescent wards was infected, although, owing to the press of patients in the acute wards, persons were transferred to the convalescent wards almost immediately after the acute stage of the fever was passed, and presumably a week or two before they ceased to be infectious, yet so few of the nurses in the acute wards, all of whom were intimately in touch with the patients during the whole course of the epidemic, were attacked, although unprotected by a previous attack.

Continuing, Professor Hay says that, having in mind the analogy of malaria and certain other fevers, he began to sus-



pect that the infection of typhus might be conveyed by insects—in this case body vermin—such as fleas. The fleas feed on the blood of the patient and may become themselves infected and act as carriers of the infection to fresh human beings, as mosquitoes are known to do in malaria and yellow fever, although he regrets that it was not found possible by experimental investigation to test this suggestion owing to the typhus germ having not yet been isolated by any bacteriologist, but that the following facts strongly support this hypothesis:—"In the first place, every typhus case seen and examined by his assistants and himself exhibited flea-bites, and the members of the hospital staff who complained most of flea-bites were those who were attacked with typhus. The ambulance driver who ultimately contracted the disease and died had repeatedly changed his underclothing because of fleas which he received upon his body whilst carrying some of the patients in his arms.

"In the second place, every case, however clean and free the patient might be from body vermin, was found to have been at the probable time of infection in contact with vermin-infested patients."

After the death of the ambulance driver Professor Hay arranged for the rest of the ambulance staff to take precautions against the invasion by fleas from typhus patients or clothing by wearing top boots, then stuffing their trousers legs inside the tops of the boots, by wearing closely-fitting overalls buttoned tightly up at neck and wrist, and smearing the neck, wrists, and ankles with eucalyptus oil, after which precautions no member of the ambulance staff took typhus, and practically did not suffer from flea-bites.

Professor Hay was very careful to distinguish between flea-bites and petechiæ from rash.

In the last small outbreak in Carlisle seven out of the eight patients were flea-bitten, three being severely bitten, the marks being easily differentiated from the petechiæ present, the other patients being not so badly bitten, but still showing a number of distinct flea-bites.

The two first females had vermin in their heads and were very flea-bitten, but no body lice were observed in any of the cases, and the bedding from each house superficially appeared to be free from lice, but the two houses from which the first two and the last case were taken were bug infested.

The writer recalls that during a sharp short outbreak of the

disease at Bootle the only individual on the sanitary staff who contracted the disease was the male ambulance attendant, in whom the disease proved fatal, and who frequently complained of the annoyance which he was subjected to from flea-bites occasioned whilst handling and carrying the patients, clothing, and bedding.

It is significant that in former times typhus in hospital spread to patients suffering from other diseases, and also to nurses and others in contact with the sick person, but those were the days unfortunately when vermin often existed in the beds, bedding, furniture, and walls of the old hospital wards, and when the clothing worn by the patients before admission was kept in old lockers by the bedside without any attempt at disinfection being made, either during the illness or at the time of discharge from the hospital.

Dr. R. K. Brown, in an article relating to typhus fever in Bermondsey, refers to the possibility of infection by mild and unrecognised cases in day schools, and points out that the epidemic in that borough showed how typhus might be kept going by a condition in children analogous to masked or latent scarlet fever; he also remarks that the origin of the first case was as obscure and difficult to trace as when Murchison propounded his theory that it arose *de novo*; he further states that, failing the masked or latent type of theory, the only other feasible suggestion is that the poison is harboured for long periods in old second-hand clothes which find their way from certain endemic centres, and, if given a favourable soil, start the disease.

At a meeting of the Academy of Science held in Paris in 1909, M. Charles Nicolle, M. Compté, and M. Conceil said that some experimental observations on which they had been engaged seemed to show that the *pediculus corporis* was the principal agent in the transmission of the pathogenic virus of exanthematic typhus. *Pediculi corporis* collected from the human body and kept without food for eight hours were placed on a monkey suffering from the disease, they were then transferred to a healthy animal of the same species, which eventually became infected. These observers therefore believe that for the prevention of exanthematic typhus it would be desirable to get rid of the parasites which infest alike the body, clothing, and bedding.

The etiology of the disease is, however, still unsettled, and the source of infection of the first case or cases of an epidemic is

usually impossible to trace. Bacilli, micrococci, and protozoa have been described in connection with the disease, still the infective agent remains unidentified, and it is therefore not improbable that the pathogenic organism may be ultramicroscopic.

In addition to the presence of the infecting agent the prevalence of the disease would appear to be dependent upon social squalor, poverty, overcrowding, filth, and also want of ventilation, the improvement of which has been accompanied by a correspondingly important decrease of the disease in communities amongst whose members it formerly exacted its heaviest tolls.

The disease is, however, still met with in some towns and cities in this country, for the predisposing features ever favourable to its spread are still in existence. Therefore, besides remedying the above-mentioned defective and insanitary conditions and social submersion we must take such measures as will insure—(1) The avoidance of exhalations and excretions from the bodies of persons ill or dying from suspicious disease, as well as where the diagnosis of the disease is established: (2) a knowledge of the possibility of infection by vermin which may desert the body either during life or after death: (3) the impossibility of clothing and bedding harbouring living vermin after being in contact with an infected person: (4) that contacts should be regarded as potential sufferers and therefore carriers: (5) that the public may be educated to the knowledge that the atmosphere of an apartment occupied by the sick person, when vitiated, may possibly determine the disease in others occupying it: (6) the knowledge that in some individuals, especially children, the disease may be met with in a very mild form.

For as science every day brings to light something new in respect to the part played by insects in the causation of disease, in view of the modern trend of opinion as to its transmission, it may not unreasonably be assumed that the infection in typhus fever has more than a chance relationship to the vermin-bitten skin.

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## HEREDITY AS A CAUSATIVE FACTOR IN DISEASE.

By G. M. C. SMITH, M.A., M.B., C.M., M.R.C.P.,  
Major I.M.S.

AT the present time, when so much attention is being paid to heredity in disease, all observations bearing on this question must be of interest. I therefore publish some observations made by me some years ago, with the conclusions I have drawn from them. I am particularly led to do so now as it appears to me that, in respect of the vast majority of the diseases in which heredity plays a part, research is, perhaps, being carried on on wrong lines.

Among the various morbid conditions in which heredity is supposed to have some etiological force we may recognise several classes. I do not claim that my classification is scientific, or that it is more than approximately correct. First is the congenital specific infectious disease. This is not, strictly speaking, hereditary, but is the result of direct infection, and need not be considered further here. Secondly, there is a class of diseases, most of which, fortunately, are rare, in which some particular tissue appears to be defective. Among these are arteriosclerosis, hæmophilia, and certain diseases of the nervous system. With regard to these, generally, it cannot be said that we yet know how a particular tissue becomes subject to degenerative or other abnormal processes, or why it should remain so in successive generations of a family. We can only believe with Professor Osler "that in the make-up of the machine bad material was used," and accept the fact that the badness of the material, originally acquired as the result of unknown causes, is transmitted from one generation to another. This is probably the only class of true hereditary disease, and the inquiries now being carried on by so many trained observers should eventually throw light on the laws that govern their heredity. But there remains a large number of widely-differing morbid conditions in which heredity is, apparently, an undoubted predisposing factor; in which, if we extend the connotation of the word heredity to all that is transmitted to an individual from his forefathers, it may almost be considered an essential factor. Yet these diseases cannot, in my belief, be strictly called hereditary. Though they vary extremely in their nature they may be placed together in one class, as they are united by one common bond, a condition pre-



disposing to them all, which is undoubtedly a transmitted inheritance. This class includes specific infectious diseases, notably acute rheumatism and tubercle, alcoholism and drug habits, anatomical deformities, epilepsy, hysteria, neurasthenia, chorea, certain forms of insanity, probably some of the diseases known as rheumatoid arthritis, and possibly gout. With regard to most of these diseases, probably all are agreed that a family predisposition is commonly a prominent feature in their history, but it appears to be generally held that there is what may be called a specific heredity for each—that tubercle, as it were, begets tubercle, and insanity insanity. I believe that this view is incorrect, and that these diseases do not breed true, but that they result from, or are manifestations of, a common congenital defect underlying them all and predisposing to them all, namely, degeneracy. This has been defined as “a state of imperfect development, originating probably in malnutrition on the part of an ancestor or of the individual during the period of growth, affecting many or all of the bodily systems and functions, *and always involving a dissolution of heredity.*”<sup>1</sup> From the clinical point of view we may offer another definition of degeneracy as a state of instability, manifesting itself in variations from the anatomical and mental normal, in the imperfect performance of physiological functions, in susceptibility to infections, in liability to various neuroses and psychoses, and in a tendency to moral perversion. Affected persons do not inherit epilepsy, nor a tubercular diathesis, but are degenerate, and so are peculiarly susceptible to the exciting causes of these diseases, the fact that a given individual falls victim to one or more and escapes others being the result of the individual environment. One degenerate, working in overcrowded and ill-ventilated rooms, develops tubercle; another, prematurely forced at school, becomes neurasthenic or choreic; a third, disappointed in his affections or ambitions, becomes insane or takes to alcohol.<sup>1</sup> Other potent factors in determining the form in which the degeneracy manifests itself

<sup>1</sup> Since writing the above my attention has been drawn to Dr. Harry Campbell's suggestion that alcoholism may be due to the absence from the blood of some stimulating substance which is normally present, and to Féré's observation that pulmonary tuberculosis is not infrequently associated with slight abnormality of the osseous conformation of the chest. Both of these appear to militate against my argument. The former is, however, merely hypothesis, as yet incapable of proof; and the latter is by no means invariable, and, of course, does not apply at all in cases of tubercle other than pulmonary.

are example and imitation, which act with peculiar force in the case of degenerates, as they do with children, and this is especially true as regards alcoholism and psychoses, perhaps, also, some neuroses. Thus these forces give rise to an apparently specific inheritance of a particular morbid condition, which is in reality merely a manifestation of degeneracy.

The belief in a specific heredity for each of these abnormal states is widely and firmly held. As evidence of this I may refer to a statement which I have recently seen attributed to Professor Karl Pearson to the effect that between three and four hundred pedigrees of tuberculous stock and four hundred family histories of insanity had reached the Eugenics Laboratory in London. If these family histories are full records of all the pathological conditions existing in all known members of these families, and if, in addition, the presence or absence of the physical signs of degeneracy has been noted, they should furnish ample confirmation or disproof of the theory here advanced. The existence of a distinct tubercular type of face or figure would seem to be entirely inconsistent with my view that the disease to which a given degenerate falls victim depends solely on individual environment, and such a type or types are generally recognised. But do these types really indicate a special predisposition to tubercle, and to tubercle alone? Are not they and the so-called rheumatic type merely evidences of degeneracy? Sir Dyce Duckworth,<sup>2</sup> speaking of the scrofulous type, says: "It is a veritable forcing-ground for every kind of microbic intrusion, so that such individuals are the worst subjects for all infections, and have every ailment in a grave form." Is not this merely the susceptibility of the degenerate to infection? The fine tubercular type I and others have frequently seen in rheumatic and nervous children. Of these types Dr. Goodhart<sup>3</sup> writes they "have sprung out of experience and should be well remembered. But the student's difficulty will be that he is unable to push these definitions sufficiently to be of use to him, and as soon as he seeks to be enlightened, not upon the tubercular appearance, but upon the distinctions between it and others—particularly that which is called by some the rheumatic conformation—so that he may be able to say this is one thing, that certainly another, he finds his teacher fail him. Types of this kind will not bear too close a scrutiny—it would puzzle anyone to distinguish many a rheumatic child from a tubercular one." More bluntly we may say that these two types are, in reality, one: that this type is found in association with both tubercle and

rheumatism, and, I may add, with other abnormal conditions resulting from degeneracy; and that believers in the specific heredity of these diseases have sought to differentiate two types, with but little success. The conformation is in itself merely a manifestation of degeneracy, and its association with tubercle or rheumatism, or neither, depends solely on the individual degenerate's exposure or non-exposure to the exciting causes of these diseases.

There are, of course, many families in which tubercle does appear to be hereditary. The explanation of this is that these families are degenerate, and members of them being, on that account, peculiarly susceptible to infection, are probably subjected, through family habits or otherwise, to other predisposing causes of tubercle, and almost certainly at some period to grave risk of infection from some one of their already tuberculous relatives. Or, to put it differently, in a given degenerate family the environment is such that there may be active only one exciting cause, which in this family produces tubercle; in another family a different cause or causes may lead to alcoholism; and in a third to insanity. It is easy to say that in these families tubercle, insanity, or crime is hereditary. It is easy, too, to collect statistics of the incidence of the particular abnormality in such families. But it is not easy, apparently, to find any law or theory of heredity to fit our statistics. The fact is that we are so obsessed with the idea of the heredity of these conditions that we have neglected to get full family histories.

Odd cases of anatomical defect, of mental deficiency or abnormal efficiency, of acute rheumatism, or of drug habit have been thought to have no bearing on the case when we have been investigating the history of a family in which the salient feature is tubercle. Yet in many, probably in the great majority of families in which there is an evident history of one of these conditions, on full investigation some of these others will be found side by side with it. Such families have undoubtedly an evil inheritance, but, as Dr. Campbell Smith<sup>1</sup> has said of the losses of racial characteristics in degenerate families, these morbid conditions cannot strictly be described as inherited, seeing that they vary in successive generations and in different members of the same generation. As examples of the occurrence in families of several of these so-called hereditary morbid conditions, which I consider not hereditary but dependent on an underlying degeneracy, I give some family histories, collected for the most part

in the out-patient department of a London hospital. Some are incomplete, and possibly none are absolutely correct, but the patients and their relatives would not wilfully attribute non-existent maladies to the members of their families, especially as, in eliciting the histories, no leading questions were asked. There is indeed much greater probability of there being errors of omission of abnormal states that had escaped untrained observation. In an out-patient department it is not always possible to make the detailed examination necessary to determine the presence of many of the anatomical signs of degeneracy; but in members of all but one of these families some one or more of these signs were found on superficial examination.

1. Father with tubercular family history, has himself suffered from acute rheumatism. Mother has myxœdema. Six children. Four died in infancy, one suddenly, the others from diarrhœa. Of the two remaining children one is epileptic and the other tubercular.

2. Father reported healthy. Mother has had acute rheumatism, and her sister is tubercular. Five children. Two reported healthy, one has hip-joint disease, one is "delicate," and the fifth is a very excitable child who has had growing pains, and has a dilated heart and chorea.

3. Father alcoholic, disappeared years ago. Mother suffers from "nervous debility," and, along with two other members of her family, has had acute rheumatism. The two remaining members of her family are delicate, one from unknown causes, the other from nervousness. Six miscarriages, occurring irregularly between live births. Seven children, of whom four are dead. In one the cause is definitely stated as tubercle of the lungs, in the other three as congestion of the lungs, which in one case followed whooping-cough. Of the three living members of this generation, all adult, two are, from their history, obviously tubercular, and the third is subject to hysteria and erythromelalgia. In the third generation there is an illegitimate daughter who has tubercle and is hysterical.

4. Condition of parents unknown. Three children. One died of meningitis aged 7, one is "nervous," and the third has enlarged tonsils, adenoids, night-terrors, and chorea.

5. Condition of parents unknown. Two children. One dead, insane; the other is tubercular.

6. Father healthy. Mother dead, tubercular. Two children. One tubercular, the other has had acute rheumatism twice, and endocarditis.



7. Father reported healthy. Mother neurasthenic. Three children. One dead of "congestion of the brain," one is tubercular, and the third has had rheumatism and chorea.

8. Father reported healthy. Mother neurasthenic. Four children, of whom two are reported delicate, one has had pleurisy, and has tonsillitis and erythema nodosum, and the fourth has had chorea and pleurisy, and is now tubercular.

9. Father has had acute rheumatism. Mother shows anatomical stigmata of degeneracy. Seven children. Four are reported healthy, one has had acute rheumatism, one has chronic otorrhœa, and the seventh is tubercular, has night-terrors, and is "vicious."

10. Condition of parents unknown. Two children. One has gross anatomical deficiency and the other is epileptic.

11. Father reported healthy. Mother has had acute rheumatism. Her mother was tubercular, and a sister died of "bronchitis" aged 19. Three children. One reported healthy. The two remaining are neurotic, and one of them has exophthalmic goitre.

12. Father healthy. Mother reported healthy, but her mother, maternal grandparents, and two aunts were all insane, and of her two brothers one died of "burst spleen" and the other has disappeared, deserting his wife. Four children. One is reported healthy, one has rickets, and the other two have had chorea, one of them endocarditis, the other pericarditis. The last is also very passionate.

I have notes of other similar histories, but these will suffice. In addition, I have notes of a large number of cases in which, with signs of degeneracy, there has been one of this class of diseases in the child, with another in the parent, but in these the child being an only child, or the only one known to be abnormal, the case is not so strong. It may be said that these examples merely show that degenerate families are liable to a large variety of diseases, a fact which is already well known. But I inquired into the family history in practically all cases of this class which came to my notice and elicited a similar history in a very large number. Further, almost invariably in families with a decided history of tubercle well-marked evidences of degeneracy may be found. The conclusion is that a tuberculous family is a degenerate family. It is immaterial whether the degeneracy preceded the tubercle or not. The degeneracy may have originated in the malnutrition of a tuberculous ancestor;

or the tubercle may have first occurred as a result of degeneracy; its continuance, however, depends solely on the family becoming degenerate. The important point is that, the family being degenerate, there is necessarily a dissolution of heredity, and to search for laws governing the incidence of the disease is therefore unavailing. The same holds good in the case of acute rheumatism, and particularly in cases in which there is chorea. This leads to the observation that the nervous manifestations of certain infections are due not only to the infection but to the infection *plus* degeneracy, which appears to render the nervous system peculiarly susceptible. In addition to chorea I refer particularly to tabes dorsalis and general paralysis of the insane.

The view that these conditions and diseases are not in themselves hereditary, but merely manifestations of degeneracy, explains the well-known frequency with which alcohol and tubercle, and alcohol and insanity, and tubercle and insanity are associated. Alcohol is often given as a predisposing cause of tubercle and insanity, but the truth seems to be that it is degeneracy that predisposes to all three. How many cases are there in which, with a family history of alcoholism and tubercle, it may be seen that the victims of alcohol escape tubercle, while the tuberculous have never indulged in alcohol? The excessive occurrence of tubercle in prisons and asylums is similarly explicable. It is usually ascribed to the defective hygienic conditions prevailing in these institutions, but I may safely say that in the majority of these there is less overcrowding and better ventilation than in the average working-class home, or in many better-class houses. In this connection I must refer to a very valuable paper on "Tubercle in the London County Asylums" by Dr. Mott,<sup>5</sup> in which he shows that the causes of tubercle do not inhere in the asylums, that there is little evidence of its spread in them by direct infection, that young subjects suffering from melancholia, dementia præcox, and imbecility, and general paralytics all conditions, I may add, depending on degeneracy—are specially prone to the disease, and, finally, that it is most prevalent among Jews at Colney Hatch, these being drawn from a class who for generations have lived in great pauperism and degradation, and who are therefore almost certainly degenerate. A connection between insanity and movable kidney has been observed, and one author has ascribed a causative influence to the latter. Movable kidney—splanchnoptosis in general—is of common occurrence in

degenerates, and its co-existence with neurasthenia is well known. Its connection with these different morbid states is further evidence that they are not hereditary, but that there is a transmitted condition underlying both them and the anatomical abnormality.

It is evident, I hope, that I do not mean that without degeneracy there would be no tubercle, but that there would be no tuberculous families, and that every degenerate is potentially tubercular, the development of the disease depending almost solely on his environment. Similarly the rheumatic, insane, and neurotic families are essentially degenerate, the particular form of morbidity that appears to be hereditary in them depending solely on environment.

If this view is correct, and these diseases are in truth always dependent on a condition which involves a dissolution of heredity, it will be difficult to find laws which govern their heredity. This is what I meant by saying that, in respect of these diseases, research appears to be being carried on on wrong lines. I would suggest that observers investigating family histories of the kind I have indicated should not limit their inquiries to any one disease, but should, as far as possible, obtain complete histories of family morbidity, and, in addition, should in all cases look for evidences of degeneracy.

REFERENCES.—<sup>1</sup> "Degeneracy," by Dr. Campbell Smith, *Edin. Med. Journ.*, 1907, p. 241. <sup>2</sup> *Brit. Med. Journ.*, 20th March 1909. <sup>3</sup> *Diseases of Children*, 3rd ed., p. 339. <sup>4</sup> *Loc. cit.* <sup>5</sup> *Archives of Neurology and Psychiatry*, 1909, vol. iv., quoted in *Brit. Med. Journ.*, 24th April 1909.

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## “ERGOTHERAPY” IN NEURASTHENIA.

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A “SYMPOSIUM” on the subject of neurasthenia, published in a recent number of a monthly contemporary,<sup>1</sup> draws one’s attention anew to the astounding diversity of opinion which exists among the medical profession regarding the nature and origin of this common condition. Thus, not a few eminent authorities would ascribe the majority of such cases to floating kidney; to others with ophthalmological experience the condition is essentially dependent on eye-strain; others, again, see in it merely a symptom of gastric dyspepsia or of autointoxication from the large intestine; and there are many other theories, several of which are touched upon or advocated in the discussion above referred to—we have, in fact, to deal with what is practically a case of “*Quot homines, tot sententiæ.*”

Why this great discrepancy of views? For though the boundaries of neurasthenia—where it merges into other conditions—are obscure, still it is a disease which, as ordinarily met with, presents a definite enough clinical picture. It is not in diagnosing this condition so much as in its interpretation that Galen says Yes and Hippocrates says No.

Everything points to the fact that, if we are to deal radically and successfully with this multiform symptom-complex, we must approach it with a wider outlook than that which any field of specialism offers. Hitherto there has been too marked a tendency to ascribe primary etiological significance to what are, as often as not, merely symptoms.

It appears to me perfectly certain that the essence of neurasthenia is a weakness of the *psyche*—a psychasthenia, in fact. For practical purposes this may be otherwise expressed as a weakness of the *will*. The will, like any other faculty, becomes weak through not being used. The prevalence of neurasthenia at the present day (as well as of the conditions bordering on neurasthenia which are more or less apparent in a large proportion of people generally reckoned “healthy”) is, to my mind, a result of the tendency, now so common, to shirk the deepest natural promptings towards a healthy life—in other words, towards *struggle*,



*endeavour* (the essence of life). This refusal to obey Nature's most fundamental law—the development or fulfilment of one's individuality *against resistance*—results in a weak, undeveloped will; and this it is which constitutes the essence (or, perhaps better, the predisposing cause) of neurasthenia.

The psychasthenic is usually one who, although possessing considerable individual potentialities whose realisation would benefit the society of which he is a part, has yet failed to “live up to” these potentialities. His will, therefore, has grown weak, and the predisposition to neurasthenia becomes an actuality when, the external supports of his earlier years having been withdrawn, he is more or less suddenly confronted with the hard realities of existence. His moral defences give way under the strain, and he is labelled “a case of nervous breakdown.”

Doubtless people of the strongest personality do, under very special circumstances, become neurasthenic; in the vast majority of cases, however, it is not so much the undue opposition of the *milieu*, as the previously neglected development of the individual's combative powers which proves his undoing.

We hear often that “So-and-so has had a nervous breakdown from overwork.” My conviction is that it is under- rather than over-work which kills. The man who does not work in the right spirit, who does not put his *best* into his work—this is the man on whom “worry” fastens its grip, and whom eventually it lays low. Work (in the proper sense of the term) is what keeps people alive—work, effort, struggle is, I repeat, the fundamental law and “purpose” of life.

The environmental disturbances which act upon the psyche may be somatic as well as extrasomatic; thus, besides “worry” in its broadest sense, we may find various toxins and other physical agents acting as the determining cause of neurasthenia. These conditions, however—psychical or physical—would be powerless in the absence of the predisposing cause, and this factor is, I claim, of a purely psychical nature, and, as such, modifiable by the good sense and voluntary effort of the sufferer himself.

A few words may be devoted to symptomatology. This psychical condition expresses itself primarily through the nervous system. Apart from the well-known mental manifestations (the phobias, the suggestibility, the hypersensitiveness, the tendency to exhaustion, etc.), we have a general condition of diminished vitality which shows itself in other organs and tissues.

To touch upon a few typical examples: The lack of steady nervous control leads to a general state of atonicity—in the circulatory system this is shown by irregular cardiac action and by various well-known vasomotor phenomena; other non-striated muscle-fibres become affected, and we have spasms and dilatations (*e.g.* of stomach and intestines); the supporting tissues sag, producing the various splanchnoptoses (*e.g.* gastropptosis, floating kidney, perhaps uterine displacements); the ciliary muscle goes into a state of cramp or paresis, hence accommodative asthenopia; the glandular structures become disorganised, causing such “secretory neuroses” as mucous colitis. It is impossible to estimate the deleterious effect of what Leonard Williams<sup>2</sup> calls “the emotional vascular see-saw” upon the general metabolism—hence the possibility of disturbed function in any organ of the body.

The possibility of the further step, from chronic vascular congestion through cellular proliferation to definite organic change, needs no great stretch of imagination to conceive. This is, however, somewhat apart from the subject in hand.

Doubtless many of the symptoms of functional disorder come themselves to play, to some extent, a causative *role*: thus imperfect peristalsis brings about constipation and auto-intoxication, and this latter, in its turn, poisons the nerve-centres, thus intensifying the original condition. But despite the fact that these vicious circles are set up, my point is to bring out that the primary and fundamental lesion is the psychical one, and that to attempt to give first attention in treatment to the somatic manifestation is plainly a case of “putting the cart before the horse.” Our treatment must be directed towards the *fons et origo mali*—in a word, to the psyche.<sup>1</sup>

The various methods of treatment commonly adopted may be roughly grouped as (*a*) radical, and (*b*) palliative, the first group attacking essentially the predisposition, and the second being mainly concerned in removing the exciting causes.

(*a*) Radical methods may again be subdivided into (1) those in which the patient is not withdrawn from his ordinary environment, but encouraged to make better use of it—to master it

<sup>1</sup> Here I may state, in parenthesis, that I hold no truce with the still predominant materialistic school in biology. I believe “Life” to belong to an entirely different category of things from the sense-impressions which we call “matter and energy.” Life is an unknown principle which, as Sir Oliver Lodge has said, while manifesting itself through the physical, essentially transcends and dominates it.

instead of letting it master him. Characteristic of this environment are business and domestic responsibilities, and harmful "suggestions" conveyed by tactless if well-meaning friends. The patient must be stirred up to "face the music;" he must be taught how to turn pain to his advantage instead of running away from it. If he be intellectually disposed he will get helpful moral stimulus from writers of a strongly individualistic trend, such as the old Stoics (Seneca, Marcus Aurelius), or their modern successors (*e.g.* Emerson, Carlyle, Meredith, Browning); the more definitely "religious" classics may, if properly understood, prove a support to him at this stage. It is for the doctor to direct the patient's thoughts, both through personal exhortation and through literature, inculcating always, however, the principle expressed by the French writer Guyau, that "*Celui qui n'agit pas d'après ce qu'il pense, pense incomplètement.*"

(2) The same principles worked out in a sanatorium, the environmental strain of the patient's former life being gone back to only after a graduated preparation. I shall return to this later.

(b) Palliative and symptomatic treatment. This includes all methods in which no attempt is made to re-educate the will, and in which the patient is encouraged by his doctor to run away from his worries. The wholesale prescription of holidays and of hypnotic and analgesic drugs as the essential basis of treatment in these conditions is a standing reproach against our profession. Doubtless these methods have their use, but it should never have been anything else than a strictly subordinate one. The slaves to the drug habit, whose numbers seem to be increasing around us, owe their condition, in only too many instances, to the unwise leniency of their medical adviser.

While, as I have said, the ideal would be to treat all psychoneurasthenics without changing the conditions of their life, still in practice it becomes often necessary to alter their "circumstances" for a time at least—in other words, to *remove* them somewhere. It appears to me that the best place for this purpose is a sanatorium, where a definite "moral re-education" can be carried out. A few words on the practice which I usually adopt with my own sanatorium patients may not be out of place here. My main aim is to get them interested as far as possible in congenial, creative work—to get them to *express*, to *realise* themselves through this work. They are encouraged to take up such occupations as basket- and pottery-making, clay-modelling, garden-

ing, wood-carving, &c. I can speak very highly of the results of this treatment, which I have elsewhere<sup>3</sup> designated "Ergo-therapy" (*i.e.* the occupation cure). The whole principle is to draw out (to "educate" in the most literal sense) the healthy tendencies, rather than directly to repress the bad.

It is well that the patients should have explained to them the pathology of their condition, so that they may enter with greater readiness upon the treatment based thereupon. The doctor, by tactful repetition, should thoroughly persuade them that their *morale* has grown weak mainly through want of exercise, and that it therefore behoves them systematically and doggedly to set about cultivating it. Here is where methods of "suggestion" may be most fruitfully employed, and, in the most obstinate cases, perhaps even hypnotism; this latter method of reinforcing healthy suggestion will, however, be the less needed in proportion as the doctor has a firm belief in the main principles of his treatment, coupled with a somewhat more than moderate amount of patience in driving these principles home.

My experience is that chronic phthisis cases in sanatoria suffer much from minor neurasthenic symptoms, and that this is less due to any specific tubercular toxæmia than to the useless lives which such people (with most of their faculties intact) are usually condemned to live in these places. This glaring defect in sanatorium treatment is now, however, beginning to be recognised, as witness the provision made for physical exercises at such places as Frimley and the Royal Victoria Hospital in Edinburgh. In explanation of the favourable results of graduated exercise I think, however, that too much stress is laid upon the theory of "autoinoculation," and not enough upon the psychological factor. When a sick man finds he is "able to do something," especially something useful, all his vital forces are stimulated; his self-respect and his "faith" revives, and all this cannot fail to react powerfully upon his bodily condition.

In short, then, I hold that in the management of functional nervous disease, whether occurring in a pure form or as a complication to other maladies, our main object should be to evoke the patient's own vital powers by stimulating him to self-expression through work, and that treatment by drugs, by rest-cures, by recreation, and the like should all play a strictly subordinate part to this fundamental indication.

REFERENCES.—<sup>1</sup> *The Practitioner*, January 1911.   <sup>2</sup> *Brit. Med. Journ.*, 1st October 1910.   <sup>3</sup> *Brit. Med. Journ.*, 18th June and 16th July 1910.



## CLINICAL RECORDS.

## CASE OF ACUTE GANGRENE OF THE CECUM ASCENDING, TRANSVERSE, AND DESCENDING COLON. OPERATION. DEATH. AUTOPSY.

By J. W. DOWDEN, F.R.C.S.,  
Assistant Surgeon, Royal Infirmary.

THE following case is of interest on account of its extreme rarity.

W. R., aged 51, male, married, a labourer working on the night shift, was admitted to the Edinburgh Royal Infirmary on 13th January 1908, under my care.

On admission the patient looked young for his years, and appeared to be a healthy, well-nourished man were it not for some lividity of the face, which betokened both anxiety and pain. There was evident impairment of respiration, and the rate was quickened to 36 per minute. The temperature was 97° F., and the pulse was 136 per minute, small and compressible. His complaint was pain in the abdomen and distension. On inspection the abdomen was generally and markedly distended, no respiratory movements were visible, and there was no sign of intestinal "patterns."

On palpation the abdomen was so tensely and uniformly distended that only one point of importance could be gained by examination, and that was a remarkable absence of pain. The note on percussion was tympanitic all over, except that the liver dulness was appreciable.

Examination of the hernial regions and rectum revealed nothing of note, nor did the examination of the other systems throw light on the condition or negative operation.

The history was that the patient had always been a very healthy man till some three weeks before admission, when he began to suffer from vague griping abdominal pains in the morning and some diarrhoea, chiefly mucous; blood had never been passed. At times he suffered from constipation.

On the 13th of January—the day of his admission—he returned from his night's work, went for a walk, and later partook of a meal before going to bed. At 11 A.M. he was suddenly seized with pain in the lower part of the abdomen, which very soon began visibly to swell; this interesting fact was according to his own statement and that of a grown-up son. The pain soon became general over the abdomen and was constant, while later he vomited some unpleasant smelling fluid. Local applications failed to relieve the pain, and as he got steadily worse he sent for his medical attendant, who transferred him at once

to the Royal Infirmary, where he was admitted at 10.30 P.M. The patient stated that just before admission he had passed some pure blood *per urethram*. No action of the bowels had taken place on the day of admission, and no flatus had been passed since the onset of symptoms.

With regard to the other systems there was nothing of note.

*Diagnosis.*—The urgent nature of the symptoms pointed to obstruction, acute in character, but as to the site and cause it was impossible to come to any more than doubtful diagnosis of volvulus. The history of so-called diarrhoea with mucus, and occasional constipation, in a man of his years certainly suggested the probability of malignant disease low down in the great intestine.

There was no doubt that the abdomen should be opened, and this was done at 11 P.M. under ether anaesthesia.

An incision was made to the left of the middle line, chiefly in the lower half of the abdomen, and the anterior sheath of the rectus was split in its long axis. So great was the intra-abdominal tension that the fibres of the rectus separated, but no hernial protrusion occurred. Large towels wrung out of hot saline were gathered all round the wound in order to catch the coils of distended intestine. The posterior sheath of the rectus was so tense and stretched that it was impossible to pick it up with forceps, and it consequently was opened by careful incision. It was a matter of surprise that nothing protruded from the peritoneal cavity. The omentum could be seen lying naturally, and below it coils of small intestine, somewhat congested, but not in any degree distended. There was no fat necrosis.

The incision was now enlarged upwards, when the cause of the distension appeared in the shape of transverse colon, purple black in appearance and tensely distended to the size of an ordinary coat sleeve. There was a rent in the peritoneal coat in the long axis of the gut. The colon was now punctured with a trocar and cannula, but gas only escaped, not under pressure, while the bowel did not collapse at all. Retractors were introduced, and it was then that the caecum, ascending, transverse, and descending colon were all seen to be similarly affected.

The abrupt termination of the process was most striking at the ileo-caecal junction and at the end of the descending colon, while at this latter point a tumour could be made out, malignant in its characters. No occlusion of arteries could be discovered, and in fact it would be a most unlikely occurrence that interference with the vascular arrangement, involving the superior and inferior mesenteric arteries or veins, could have been limited in this striking fashion. No cause was discovered unless it had to do indirectly with the new growth in the lower colon.

The condition of the patient was such that further procedure was unjustified: a Paul's tube was tied into the transverse colon. At first

he was much relieved by the operation, but later became rapidly worse and died at 11 A.M., exactly twenty-four hours from the onset of his symptoms.

The following is the report of the post-mortem examination made by Mr. Wade. Rigor mortis general. On opening abdomen it was found to contain 15 ozs. of somewhat turbid fluid. Abdomen distended extremely.

Peritoneum throughout shewed evident reaction to acute gangrenous peritonitis. Omentum rolled up and carried to the right. Small intestine in centre distended with gas, surrounded with large bowel extremely distended. Serous coat was ruptured along caecum, ascending, transverse, and descending colon. Walls of large bowel dark and gangrenous looking.

Superior mesenteric artery was dissected out *in situ*. The rami intestini tenuis, ileo-colic, right colic, and middle colic were traced to their terminal ramifications, and apart from a minute thrombus in a gangrenous part of the bowel no thrombus was detected. The corresponding veins were also healthy. The abdominal aorta showed atheromatous degeneration. Inferior vena cava healthy. Portal vein and hepatic artery showed no occlusion of their lumen.

Great bowel contained large quantity of frothy fluid, and small intestine showed some catarrh of mucous coat. Large intestine showed extreme distension of lumen, numerous haemorrhages in sub-serous tissue. Occasional minute follicular ulcer, but no dysenteric desquamation of mucous coat. The bowel was dark in colour and gangrenous. This change was evident from caecum to termination of descending colon. At this point an abrupt alteration was seen. The mucous coat was of pale salmon pink colour, healthy except for occasional petechial haemorrhages. This held good for about 5 ins.—to summit of sigmoid flexure—when lumen of bowel was invaded by a mass of breaking-down tissue, having appearance of an annular carcinoma. The muscular coat above this stricture was hypertrophied, but not to a great extent. Sigmoid flexure showed some atrophy of coat, but mucous membrane was healthy. The liver was soft and showed post-mortem staining and acute cloudy swelling. The spleen also showed post-mortem staining and was soft and diffuent. The stomach was somewhat distended and showed slight catarrh. The kidneys showed advanced fatty degeneration with chronic interstitial nephritis, arterio-sclerotic atrophy.

Films made from the faecal contents of the large bowel showed bacillus coli communis to be diminished in number: diplococci and bacillus aerogenes capsulatus increased. Cultivations made from the intestine and spleen—aerobic and anaerobic—aerobic mixed growth B. coli communis and a few Gram-positive diplococci-anaerobic: few bacilli seen capsulated and many Gram-positive diplococci.

*Summary.*—Annular carcinoma of the sigmoid flexure. Acute dis-

tension of the large bowel over this with acute bacterial gangrene. Early general peritonitis. Interstitial myocarditis and nephritis. Toxaemia.

So far the writer has been able to discover only two comparable recorded cases affecting the large intestine in such an extensive manner. All surgeons are acquainted with the spread of gangrene from the appendix to the caecum, but extensive gangrene of the large intestine is only mentioned by Lanphear and he has recorded two cases (*Amer. Journ. of Surg.*, vol. xx. No. 5, p. 145). The account of one of his cases, briefly, is as follows:—

A boy, aged 7, was operated on for appendicitis, with huge abscess. Eight months later he had "abdominal cramps," and was operated upon thirty-eight hours after the initial pain. He was found to be suffering from gangrene of the entire colon as far as the sigmoid. "It was now seen that the constricting element was a band of adhesions located at the caecum, while it encircled the lowest portion of the descending colon as well as the ascending." In a footnote Lanphear states: "In my second case of gangrene of the colon there was thrombosis of every artery of the mesocolon, cause unknown."

## ACUTE DILATATION OF THE STOMACH AS A POST-OPERATIVE COMPLICATION IN ABDOMINAL CASES.<sup>1</sup>

By E. SCOTT CARMICHAEL, M.B., F.R.C.S.,  
Assistant Surgeon, Hospital for Women, Edinburgh.

ABOUT three years ago I operated upon a married woman, æt 30, for fixed uterine retroversion, and suspended the uterus by Gilliam's method. The patient recovered satisfactorily from the operation, but on the third day began to vomit, and continued to do so until the seventh day.

During these four days the patient was extremely ill, and I believed her to be suffering from delayed chloroform poisoning. There was some distension of the abdomen, but no tenderness or rise of temperature to suggest a generalised peritonitis. A very good observant nurse while attending to the patient rolled her over on her left side, and somewhat on to her face, with the result that the patient vomited a large quantity of bile-stained fluid, in all from 2 to 3 pints as far as could be measured.

The patient was immediately relieved and never was sick again, making an uninterrupted recovery.

This case made a profound impression upon me, and I was unable at

<sup>1</sup> A paper read before the Edinburgh Obstetrical Society, March 1911.



the time to explain the cause of this sequence of events, but considered the condition to be one of chloroform poisoning.

On 10th June 1910 I was asked by the house surgeon of Ward 11, Royal Infirmary, to see a patient operated upon by Mr. Wallace nine days previously for hydatid cyst of the liver.

The history between the date of operation and the time when I was asked to see her was as follows:—

On 2nd June, the day after operation, her sickness became frequent, and continued so on the following days. Some distension of the abdomen was noticed on 4th June. The vomiting continued uninterruptedly until the morning of 10th June, when the house surgeon, suspecting peritonitis, called me in in Mr. Wallace's absence.

The patient was markedly emaciated and looked like a starved woman. She was markedly dyspnoeic and in great distress. On examining the abdomen, which was distended, one noticed that the distension was not uniform, but was limited especially to the epigastrium and left half of the abdomen as far as the hypogastrium. There was very slight tenderness, and the abdomen was soft, unlike a generalised peritonitis. On palpating more particularly distinct splashing sound could be detected, and there was marked dullness over the area mentioned. Believing the swelling to be due to a dilated stomach full of fluid, a stomach tube was passed and 5 pints of bilious straw-coloured fluid drawn off. The patient experienced the greatest relief, and almost immediately fell off to sleep.

About 6 o'clock the same evening I was again rung up by the house surgeon, who said that the vomiting had recommenced in the course of the afternoon, and the patient was again very ill.

The stomach had again filled up almost to the extent which it had done in the morning. The patient was very weak, and rather than expose her to the risk of her atonic stomach filling again, I decided to open it. I therefore performed gastrostomy under ether, removing at the same time  $4\frac{1}{2}$  pints of fluid similar to that vomited in the morning.

At operation the stomach was found to be a flaccid bag, completely atonic, extending into and filling the pelvis and left iliac fossa, the small intestines being crowded into the right side of the abdomen. The dilatation extended into the duodenum, as far as the duodeno-jejunal flexure, the rest of the small intestine being completely collapsed. There were no signs of adhesions or obvious mechanical cause for the obstruction, the duodenum, however, being about three times its normal size and forming with the stomach one continuous sac. After emptying the stomach it contracted visibly down to almost its normal dimensions. The patient was much relieved, but died of exhaustion somewhat suddenly five hours after operation.

A post-mortem examination on the following day by Dr. Shennan

revealed the stomach and duodenum almost normal in size and no obvious cause to explain the condition.

On 29th December Dr. Haultain removed a cyst-adenoma of the ovary in a woman, *æt.* 42, at the Women's Hospital, the tumour being the size of a six months' pregnancy.

The patient recovered from the operation satisfactorily, having no sickness on the day of the operation and none on the following day till 5 P.M., when she vomited (continuously) at short intervals. This continued for the next two days incessantly, the patient retaining nothing in her stomach.

On physical examination there was some slight distension in the upper part of the abdomen. Succussion of the stomach elicited splashing, the greater curvature of the stomach apparently descending below the level of the umbilicus.

On 2nd January a stomach tube was passed and  $1\frac{3}{4}$  pints of bilious straw-coloured fluid removed. The sickness ceased immediately, although she had vomited continuously for three days previously. Two days later, 4th January, in the afternoon, she vomited a pint of greenish bile-stained fluid, which came up apparently without effort. She had no attempt at sickness until her discharge on 25th January.

These three cases are interesting as they illustrate various degrees of severity of a condition which I believe is frequently overlooked, especially in its milder forms. Many days of sickness or discomfort to the patient result from its non-recognition, and in severe cases it is not infrequently fatal.

On analysing more particularly the symptoms of this condition the chief factors predominant are gastric atony or paralysis and hypersecretion.

In those cases reported by Bloodgood, Finney, Heile and others, the patient not infrequently presents no symptoms for two days after operation. During this period in the more subacute cases the stomach is probably slowly dilating. Although the condition in most cases reported is one in which the dilatation affects the duodenum as well as the stomach, the latter organ, according to most authorities, is the primary site of the dilatation. No evidence of obstruction at the pylorus has been demonstrated, nor has there been any evidence of obstruction at the third or fourth part of the duodenum. The dilatation extends for the most part up to the duodeno-jejunal flexure, although cases are reported in which it may stop in any part of the duodenum. These facts seem to point against the view that the lesion is a gastro-duodenal mesenteric ileus due to kink at the duodeno-jejunal flexure, to dragging of the enteric mesentery, or to pressure by the superior mesenteric vessels. This view is held by Braun and Leidel, who have made an exhaustive experimental study on the subject, but the conditions found at operation seem to disprove their theories.

The chief etiological factor seems to be some condition which produces paralysis with hypersecretion. The condition is not necessarily post-operative, as it has been observed to complicate eclampsia and puerperal septicæmia.

It is of the highest importance to recognise the condition early. In all cases of chloroform sickness persisting beyond the second day, the possibility of this condition should be eliminated. If sickness commences on the second or third day after operation it is highly suggestive of this condition.

The character of the sickness is, as far as I have seen in the two cases under my own observation, distinctive. There is not the severe retching which is so often characteristic of delayed chloroform poisoning, but the fluid is emitted more like the overflow of urine from a distended bladder, and seems more to well up into the mouth. The fluid is intensely irritating, and frequently irritates the skin of the lips and cheeks to the point of eczema.

*Treatment.*—If recognised early practically all these cases may be cured by passing the stomach tube, which however may require to be passed repeatedly. In late cases where the condition has led to starvation of the patient, gastrostomy, jejunostomy, and gastroenterostomy have been performed. Certain it is that where the stomach lies like a stagnant flaccid bag, filling up the greater part of the abdomen, drainage by one or other of the above means seems to be the *dernier ressort*. As to which of these is the best I have no experience, and it is not the purpose of this paper to discuss. In my own case I performed gastrostomy, which leads to contraction of the stomach and duodenum, and affords a means of feeding as well as of draining the stomach, at a time when nourishment is of the greatest importance.

I am indebted to Dr. Haultain and Mr. Wallace for permission to refer to the cases operated upon by them.

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ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH,  
ROYAL COLLEGE OF SURGEONS OF EDINBURGH,  
AND ROYAL FACULTY OF PHYSICIANS AND  
SURGEONS OF GLASGOW.

THE quarterly examinations of the above Board, held in Edinburgh, were concluded on 14th April.

*Final Examination.*—The following candidates passed the final examination and were admitted L.R.C.P.E., L.R.C.S.E., and L.F.P.&S.G.:—C. A. O'Driscoll, Ireland; J. J. Dykes, L.D.S., Scotland; N. K. Wilson, Canada; R. G. Walker, Montrose; W. Ashworth, England; R. S. Agrawal, Bareilly; D. A. Macpherson, London; C. Mallikarjunarao, Vizagapatam, India; W. F. G. Scott, Bombay, India; R. Parry, Wyoming, U.S.A.; and 10 passed in Medicine and Therapeutics; 7 in Surgery and Surgical Anatomy; 11 in Midwifery, and 7 in Medical Jurisprudence.

## MEETINGS OF SOCIETIES.

## Edinburgh Obstetrical Society.

THE fifth meeting of the session was held on 8th March, Dr. Haultain, President, in the chair.

The President exhibited—(a) Fibromyoma of vagina; (b) bilateral encephaloid cancer of ovary; (c) fibrocystic uterine tumour with tubercular peritonitis; (d) extra-uterine gestation.

Dr. B. P. Watson showed a uterus removed by supra-vaginal hysterectomy for intractable uterine hæmorrhage.

Dr. R. W. Johnstone read "A Note on Some Experiments on the Anaphylactic Theory of the Toxæmia of Pregnancy." After describing the condition of anaphylaxis and instancing some of its manifestations in man, he referred to the fact that Anderson and Rosenau in 1908 first suggested a possible connection between anaphylaxis and the toxæmia of pregnancy. The points of resemblance are chiefly the occurrence of convulsions during life, and after death the presence of multiple hæmorrhages throughout the body.

The theory is that some alien protein may pass from the placenta to the mother and supersensitise her, and that a second transference of the same substance after a suitable interval may account for the onset of convulsions and other symptoms. Anderson and Rosenau obtained anaphylactic symptoms in a guinea-pig by using an extract of guinea-pig's placenta, which, however, was allowed to autolyse before use.

Dr. Johnstone in his experiments used extracts of fresh human placenta and also extracts of guinea-pig and rabbit placenta. He obtained no positive results with eclamptic human placenta. No results followed the use in pregnant guinea-pigs or rabbits of extract or emulsion of placenta from animals of the same species. By the use of extract of normal human placenta he obtained anaphylaxis in eight out of twelve rabbits. This he regarded as definitely due to placental proteins. The fact, however, that he was unable to confirm the results of Anderson and Rosenau in the use of homologous placental extracts appeared to negative any connection between anaphylaxis and the toxæmia of pregnancy.

Mr. Scott Carmichael read a paper entitled "Gastro-Mesenteric Ileus as a Post-Operative Complication in Abdominal Cases" (see page 438).

Dr. Barbour and Dr. B. P. Watson gave a demonstration of the varieties of the *cystic ovary*, and showed lantern slides illustrating the microscopical characters. The frequency with which the condition was associated with salpingitis was pointed out, this probably depending upon the secondary infection of the ovary from the tube resulting in



a sclerosis of the surface which prevented the rupture of the follicles. It was wrong to class these cystic ovaries among ovarian tumours as there was no new growth, the cysts being simple retention cysts directly derived from the Graafian follicle.

Dr. Barbour and Dr. Watson also recorded three cases of double tuberculous salpingitis with extreme dilatation of the tuberculous tube. In one the tube was so large as to reach the level of the umbilicus, filling up the whole hypogastric region. Lantern slides were shown to illustrate the pathology and mode of spread of the tuberculous process. The picture was the same in all. In the less dilated parts of the tubes there were extensive tuberculous deposits in the mucous membrane, which was greatly thickened and had the neighbouring projections fused. In this mucous membrane there was a very marked proliferation of the epithelium, which was arranged in gland-like spaces and in solid masses giving an appearance like carcinoma. Where the tuberculous process was advancing the epithelium was proliferating, but in the region where many tuberculous deposits were present it was rapidly degenerating. In the more dilated parts of the tubes at the outer ends the mucous membrane was almost entirely destroyed by tuberculous ulceration, and in the very large tube a process of natural cure had occurred. At the non-dilated uterine ends the mucosa was healthy, but tuberculous deposits were present in the muscle wall. From a study of the specimens the authors concluded that the infection was probably a direct one of the mucous membrane through the fimbriated end from the peritoneal cavity.

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## RECENT LITERATURE.

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### CRITICAL SUMMARIES AND ABSTRACTS.

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#### MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.

#### MODERN THEORIES OF HYSTERIA—BABINSKI, JANET, AND FREUD.

THREE out of the four communications in the current number of *Brain* (part 131, vol. xxxiii. 1911) deal with hysteria. S. A. K. Wilson gives a résumé of modern French conceptions of the disease, and Bernard Hart discusses Freud's hypothesis. As these theories of the disease have to a great extent superseded the doctrines of Charcot, an account of them is of some interest, though it need scarcely be said that none of them has passed into the region of accepted fact. Babinski's theory may be called the "suggestion" theory; Janet's, the "dissociation of

personality" theory; Freud's, the "repressed wish" or "sexual" theory.

1. *Babinski's Conception of Hysteria*.—It is wrong to suppose that where hysteria is concerned the "Salpêtrière school" and the "French school" are synonymous. Charcot's opinion that hysteria is intimately related to hypnotism has not been verified by later work, for most experts agree that hysterics are difficult to hypnotise, while few normal persons are incapable of being hypnotised. Babinski sets out by a search for criteria to define hysteria, a term which has become, he asserts, too comprehensive. He declines to rely either on the "fixed stigmata" of Charcot—the hemianæsthesia, restriction of the visual fields, &c.—or on the transitory phenomena—the palsies, crises, mutism, and the like. These he regards as being due to unconscious suggestion by the examiner—in one hundred consecutive cases of hysteria in his service, patients who had not undergone previous neurological examination, the stigmata were conspicuous by their absence. His latest definition of hysteria is a *psychical state capable of giving rise to certain disturbances with characters of their own. It manifests itself by primary and by accessory symptoms. The former can be reproduced by suggestion and made to disappear by persuasion. The accessory symptoms are subordinate.* The essence of the definition is that the symptoms are reproducible by suggestion and removable by persuasion. Applying this definition as a test, Babinski finds that the classical symptoms of hysteria (in the old sense) fall into three groups:—(1) Those reproducible and removable as above—convulsions, contractures, tremors, sensory disturbances, bladder troubles, mutism, &c. These he calls "pithiatric" (*πειθώ*, I persuade, *ιατρός*, curable). (2) Symptoms called "emotive," because they are liable to arise from an emotional shock—tachycardia, vasomotor changes, erythema, disturbance of intestinal secretions. These, unlike the former, are independent of volition. (3) Symptoms referable to the reflexes—exaggeration of the tendon reflexes, or impairment of the cutaneous vasomotor reflexes. This group is independent of any psychical influence, and has nothing to do with either suggestion or emotion. Tested by the suggestion criterion these three groups of symptoms are independent and unassimilable: it is irrational to apply the same term to all. Why, then, continue to speak of hysteria? Misunderstanding can be most easily avoided by adopting the term "pithiatism" to denote the autonomous group comprised in the first category. In a word, Babinski has re-analysed the indisputable features of hysteria, and has found among them a peculiar and common character—that of being reproducible by suggestion; this he takes as a pathognomonic sign. Apart from the justification of this new standard, Babinski's work has been of great value (1) in showing how easily faulty methods of examination can originate hysterical symptoms; (2) in excluding such symptoms as hæmorrhages,

pemphigus, ulcers, and other trophic lesions from the domain of the disease; (3) in removing patients from circumstances and treatment likely to be harmful. Adverse criticism of Babinski's theory runs along the following lines:—The definition is too artificial, and while it may properly exclude some non-hysterical symptoms, it also excludes others frequently associated with hysteria. It is a subjective definition, expressed in terms of the relation of doctor to patient. We have no standard of suggestion or persuasion, and though (say) a palsy may be removable by persuasion—it may well happen that a practitioner fails to do so—the test is subjective, not objective. The symptoms to the exclusion of which Wilson objects are those of simulation, *e.g.* anuria and fever, mutilations, artificial dermatitis, vasomotor phenomena coming and going along with hysterical palsies, symptoms arising purely from emotional disturbances—hysterical fits, or the cure of paraplegia by fright. He also doubts whether suggestibility is of the fundamental importance which Babinski believes. Suggestibility is a normal attribute of the mind, especially in childhood. One must suppose that for hysteria hypersuggestibility is requisite, yet hypersuggestibility occurs apart from hysteria—in neurasthenia, and in Korsakow's psychosis. Hypersuggestibility may be a symptom and an effect rather than a cause of the mental state associated with hysteria.

2. *Janet's Conception of Hysteria.*—In searching, as Babinski does, for some common factor underlying hysterical phenomena, Janet believes that he has found one in "amnesia" or "absent-mindedness." He takes as his starting-point the hysterical fit, or hysterical somnambulism, in which the patient falls into a reverie, loses consciousness, and goes through some action, amounting often to a sort of "performance"; he is under the thrall of some idea, and when he returns to consciousness he has utterly forgotten the scene he has enacted. According to Janet, hysteria is a disease of the mind, accompanied by vague physical symptoms, and characterised principally by impairment of the faculty of psychological synthesis, or by constriction of the field of consciousness. Certain elementary sensations cease to be perceived and are excluded from full conscious personal perception, hence there is a tendency to a permanent and complete division of personality, and to the formation of several independent groups. Of the stigmata characteristic of the hysterical mind there are two sets:—(1) Some common to hysteria and other mental affections. The patients are neuropathic, emotional, tend to lapse into reverie, and exhibit defect of volition. (2) Some are peculiar to hysteria. Janet admits to the full the hypersuggestibility of hysterics, but, so far from making it an essential cause of the disease, he regards it as a result of the peculiar mental condition. If an individual reacts blindly to a pathological suggestion, it is because he is no longer

capable of deliberating on the ideas presented to him. Their strength rests on the ignorance of the patient. Objections, impossibilities, contradictions do not reach his mind. It is an effect, not a cause; absent-mindedness precedes and allows it. Another striking feature of hysteria, according to Janet, is the tendency to the alternation of symptom; he thinks that a special form of instability is peculiar to hysteria. Assuming that in hysteria there is restriction of the field of consciousness, it is not to be supposed that impressions reaching it, but not assimilated, are lost. On the contrary they reach, and affect, a secondary consciousness, which is a necessary postulate in Janet's theory. Consciousness is regarded as being split, or doubled, and we come to look on the phenomena of hysteria as based, in part, on the action of the subconscious mind. If, for instance, the eyes of a hysterical patient with complete anaesthesia of an arm be screened, and one of the fingers be alternately flexed and extended, the finger may continue to move after the observer has let it go. The patient has felt nothing, yet for the finger to repeat the movements these must have been felt. A psychomotor act has been performed without the patient's conscious knowledge—a subconscious phenomenon.

3. *Freud's Conception of Hysteria.*—The fundamental presuppositions underlying Freud's work are two:—(1) The doctrine of psychological determinism, *i.e.* that mental processes are subject to the law of causation, and never undetermined or due to chance. (2) That mental phenomena can be explained on a psychological basis without reference to processes occurring in the brain. A "complex" is a system of ideas possessing a certain trend, tending to generate thoughts or actions along some particular line, and the accomplishment of the object leads to an end state of satisfaction. Thus complexes are the forces which determine the course of the stream of consciousness. A complex is not continuously active; it only becomes so when stimulated by the activity of one of the ideas composing it, either through an external event or some mental association. These facts are obvious enough, but what has to be grasped is that the individual himself may be quite unaware of the nature of the complexes which determine the direction of his thoughts. An instance of this is seen when the political partisan gives his verdict on a measure; he will be unconsciously biassed, though he may honestly imagine that he is dispassionately weighing pros and cons. If two complexes tending to produce disharmonious effects are simultaneously present, the result is a state of conflict, with unpleasant mental tension, lasting till the conflict is solved. The conflict may be solved in several ways, certain of them being morbid, and in these Freud finds the cause of hysteria and other psychoneuroses. The conflict may be avoided by banishing one of the complexes from the mind—"repression"—and when this is attained the complex no longer influences consciousness. It does not, however, cease to exist, but



passes into the subconsciousness (unconsciousness—Freud). The function of the mind or mental process whereby repression is effected is named by Freud “censure.” These repressed complexes fill an important place in Freud’s system of psychology. He holds that the affective (emotional) elements of the repressed complex become divorced from the rest—intellectual and so forth. These affective elements may pass into consciousness and become linked to some other system of ideas which is not subject to repression. The “censure” is thus eluded. Examples will perhaps render the above more intelligible:—A man dependent on a rich father falls in love with a lady whom his father disapproves. In his despair the thought may occur that if his father died all would go well, and, to his horror, he finds himself playing with this thought in his imagination. A normal man will honestly recognise the existence of the wish, and would realise that it must be suppressed; this would probably be easy, for the ethical part of his personality to which the wish is unacceptable would be stronger than the part corresponding to the wish. A neurotic, however, is more likely to react towards such a conflict by refusing to own that he ever had such a wish, and striving to forget or repress it. Freud gives as an instance of transference of the affective elements of a repressed complex the case of a girl troubled by a subjective sensation of the smell of burnt pastry. It turned out that previously a complex of great emotional force had arisen. Simultaneously with the events leading to this complex some food being cooked in the room was burned. The complex was repressed and apparently forgotten, but manifested its existence by the constant presence in consciousness of one of its affective elements.

Hysteria, on Freud’s hypothesis, is due to the repression of a complex, which thereafter eludes censure in some indirect way. The phenomena which result constitute the symptoms of hysteria. A hysterical symptom is a mode in which a repressed wish obtains gratification, although in a distorted or imperfect form. The mechanisms by which a repressed complex or wish evade censure and produce hysteria are varied. The symptom may be symbolic of the wish—it may be a displacement of some affective element in the complex, as in the example given above; and there are other mechanisms. Dreams, according to Freud, are the expression of complexes which are more or less repressed. The experimental foundations of Freud’s theory, as well as his method of treatment, are the process of psycho-analysis, and the association experiments devised by Jung of Zurich. To describe these, even briefly, would occupy too much space, and we pass on to the sex theories of hysteria. Hysteria being due to the repression of conflicting complexes, Freud goes a step farther and asserts the repressed complex is always of a sexual nature. It should be noted, however, that he employs the word “sexual” in a far wider sense than

usual. Sexuality includes every psychical manifestation which ultimate analysis shows to be derived from the sex instinct. Shame, affection between parents and children are, for instance, "sexuality," in Freud's sense. In the child psychosexual manifestations occur in connection with certain definite areas of the body surface; the sexual impulses of the child have no relation to a second individual, but find their satisfaction in the auto-excitation of erogenous zones in the child's own body. The primitive sex impulses undergo rearrangement and development at puberty. If, instead of being discarded, the primitive impulses are repressed, they preserve an autonomous existence in the subconsciousness, manifest themselves in distorted forms, and produce neuroses. The outbreak of the neurosis is generally due to the great increase in sexual desire which occurs at the time of puberty. The conflict between the normal outlet, the abnormal outlet, and the repressing forces of education and environment becomes accentuated. The hysterical symptom is then produced as a compromise between the opposing trends, by which each attains a partial gratification.

Freud's system of psychology and theory of hysteria have now a considerable body of supporters, and the prejudice which was aroused against the latter by his insistence on the sexual aspects is diminishing since his use of the term "sexuality" is better understood. A full list of references will be found in the two papers on which this résumé is founded.

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## SURGERY.

### OPERATIVE TREATMENT OF ACQUIRED HYDROCEPHALUS.

A. BRUCE and J. M. Cotterill record a case in which internal hydrocephalus following on posterior basal meningitis in a girl of 11 was cured by drainage of the fourth ventricle (*Rev. of Neur. and Psychiat.*, January 1911). The attack of acute meningitis, which had been preceded by frontal headaches and vomiting, occurred in the later part of 1908, and lasted for a few days. During the next twelve months she suffered from extremely severe, spasmodic headaches, coming on early in the morning at periods of ten days. Subsequently the headaches, which were accompanied by cerebral vomiting, became more and more marked and lost their periodicity, and the control of the organic reflexes was frequently lost. In February 1910 the circumference of the head was seen to be increasing, and in May X-ray photographs showed a definite separation of the coronal suture. Mentally she became dull, torpid, and drowsy, and the subcutaneous tissues showed an appearance somewhat like that seen in myxoedema. On 15th May 1910 Mr. Cotterill aspirated the lateral ventricle through the separated coronal suture on the right side. The headaches were

to some extent relieved, but there was complete loss of sphincter control, vision was poor, and the limbs were extremely spastic. On 29th May Mr. Cotterill opened into the fourth ventricle. The occipital bone was exposed by a wide semilunar flap, and a circle of bone was removed on either side of the median ridge; then the intermediate portion of bone, together with the posterior part of the foramen magnum, was taken away. The dura was incised and the occipital sinus ligated and divided. The lateral lobes of the cerebellum were held apart, and the thickened arachnoid on the posterior part of these lobes and over the roof of the fourth ventricle was exposed. A cyst was seen bulging from the ventricle. Its wall was opened, and there was a free escape of cerebro-spinal fluid. When the flow diminished the external wound was closed. The patient's condition began to improve immediately after the operation, and she had no more headaches. By 8th July she had regained control of the sphincters, could see to read large print, and was intelligently interested in all that went on. Spasticity of the limbs diminished, and in September she again learned to walk by herself. By the middle of October all her functions were practically normal, the increase in size of the head and the peculiar condition of the subcutaneous tissues had disappeared, and beyond a slight spasticity of gait no mental or physical symptom remained.

With regard to the technique of the operation, the authors specially draw attention to the wide area of bone removed, which was probably responsible for the absence of a large escape of cerebro-spinal fluid such as had occurred after some previous operations. The free access obtained to the roof of the fourth ventricle enabled the adhesions to be easily dealt with, and probably permitted of the re-opening of channels of escape for the cerebro-spinal fluid into the subarachnoid spaces more efficiently than could have been done through a small opening.

JAS. LOCHHEAD.

#### GASTRIC AND DUODENAL HÆMORRHAGE.

Hutchinson (*Trans. Roy. Soc. Med.*, 13th December 1910) has collected from the records of the London Hospital for the years 1907, 1908, and 1909 twenty-four cases in which a fatal issue, due to hæmorrhage from recent acute ulcers or hæmorrhagic erosions of the stomach and duodenum, ensued after operations for other conditions. In twenty-one cases an abdominal operation had been performed; in thirteen of these cases it was for acute appendicitis with localised abscess or diffuse peritonitis. Some septic process was present in 80 per cent. of the cases, and Hutchinson believes that septic intoxication is the potent factor in the etiology of such acute ulcerations. The surgical treatment of gastric and duodenal hæmorrhage is discussed by

Armstrong (*Can. Med. Assoc. Journ.*, February 1911). He maintains that the same principles which guide our treatment of hæmorrhage in other parts of the body should apply in the case of hæmorrhage from an ulcer in the stomach or duodenum. He strongly deprecates the performance of a gastro-enterostomy as a routine surgical treatment. The hæmorrhage frequently recurs after this operation, which in this class of case has a death-rate of 37 per cent. It should be reserved for cases of hæmorrhage from ulcers at or close to the pylorus. If the ulcer be small it should be cauterised, if it be large and the hæmorrhage be copious the bleeding vessel should be ligated. The latter procedure may be facilitated by the use of Rovsing's electric gastroscope. Excision of the ulcer should be reserved for cases in which the other methods have failed to arrest the hæmorrhage.

D. P. D. WILKIE.

#### FUNCTIONS OF THE GREAT OMENTUM.

J. C. Rubin reports various pathological and experimental observations on the functions of the great omentum (*Surg. Gynec. and Obstet.*, February 1911). His findings, based on a hundred autopsies, were as follows:—The surface of the omentum, as a rule, was involved in an umbilical hernia, in a laparotomy wound, and in general peritonitis. In pelvic conditions the edge of the omentum played the chief part in walling off the inflammatory processes. Sometimes the omentum seemed to be the first organ concerned in the adhesive process, usually forming the roof of the abscess cavity. The same conditions were observed in prostatic and periprostatic abscesses, and in infected suprapubic cystotomy wounds. In intestinal rupture, perforative appendicitis, and perforated gastric ulcer the omentum was, as a rule, plastered more or less imperfectly to the perforation; the body of the omentum was divided into folds between neighbouring coils of intestine enclosing larger and smaller abscesses. When the transverse colon was highly distended, and when the peritonitic exudate was large, the omentum was found rolled up against the transverse colon. In intestinal anastomosis the omentum was usually attached to the circumference of the suture; in lesions of the gall-bladder the adjacent portion of the omentum usually became attached; in two cases of liver abscess the omentum showed no abnormality. Retro-peritoneal processes and lesions of the gastro-intestinal tract not involving the serosa did not affect the omentum. The same is true, in general, of new growths, an adherent omentum nearly always denoting an inflammatory change.

Experiments on animals were carried out to throw light on the question of motility or chemotaxis of the omentum. During the normal peristaltic movements of the intestine the omentum did not move. In an animal recently killed, if peristalsis was energetic, the



movements displaced the omentum. Irritation of the parietal peritoneum or of the intestine at one point did not affect its position. From a comparative study in the lower animals Rubin states that the primary functions of the omentum are not defensive in the modern sense of the term, but are purely mechanical. It affords fixation, and provides freedom of movement to the intestine, and serves as a carrier for nerves, arteries, and veins. The adhesions which it forms are often rich in blood-vessels, and this fact is taken advantage of by surgeons in disturbances of the portal circulation. Rubin ligated the entire omental splenic ligament in cats, dogs, and rabbits, and found that the spleen became encapsulated by the omentum, and received a sufficient blood supply through the adhesions. Foreign bodies, as a spleen resected from another animal, or a resected gall-bladder, when placed in an accessible position in the abdominal cavity, were in a few days completely surrounded by the omentum. Hence by its power of forming adhesions the omentum is also possessed of a defensive *role*. Its protective function is enhanced by its wide area of mobility and its comparative richness in blood-vessels and fat. Three factors are necessary for the formation of adhesions: a gross lesion; a certain amount of exudate; the injured viscus must possess a certain fixity as well as accessibility. For this reason the urinary bladder and small intestine are comparatively less frequently attached than the cæcum and appendix. To prevent adhesion of the omentum to a laparotomy wound the chief requisite is to stitch with a continuous catgut suture, and tightly, so as to leave no gaps. It is not necessary to procure broad approximation of the peritoneum. The final experiments showed that the omentum was capable of absorbing large quantities of fluids and particles in suspension.

JAMES LOCHHEAD.

#### OBLITERATION OF THE LUMEN; CARCINOMA AND DIVERTICULUM OF THE APPENDIX.

One of the views commonly held regarding obliteration of the lumen of the appendix is that the condition is physiological, due to involution. In an investigation of this theory M'Carty and M'Grath (*Surg. Gynec. and Obstet.*, March 1911, p. 211) have examined 5000 specimens obtained in the Mayo clinic, and conclude that the cause of obliteration is inflammation of the organ. Their observations were made on appendices removed for appendicitis or during the course of other abdominal operations. The average age for complete obliteration of the lumen was under 40 years. It was found in all of the decades from 5 years to old age.

The process of obliteration is apparently fairly rapid. By comparing the average age of the cases of partial and of complete obliteration

tion a rough estimate shows that the process extends over a period of 5 years.

The irregularity of the age at which the condition occurs, the early age of the average case, and the shortness of the process are all against the involution theory. Histologically this opinion is supported by evidence of chronic inflammation at the site of obliteration. The line of the lumen is sometimes indicated by a layer of epithelium, usually without folds or glands, but this fact is not to be regarded as against the inflammatory theory but rather as an example of repair of epithelium.

Carcinoma of the appendix occurred twenty times in 5000 specimens. In 90 per cent. of the cases the growth was at the tip, and the lumen of the appendix was partially or completely occluded by an inflammatory process. One out of fifty-three appendices with obliterated lumen is the seat of cancer. In seventeen of the specimens the growth was not extensive enough to be seen on the surface, and could not be recognised by the surgeon at the operation. The appearance on cross section was very characteristic. In every case the growth was of an orange colour, contrasting with the lemon yellow fat which may occur in the submucosa or subserosa in a chronically inflamed appendix. None of the cases were sufficiently advanced to give rise to metastasis. The age of the patients varied from 5 years to 80, the average being 30 years of age. Microscopically the growth consisted of alveoli filled with epithelial cells. Spread of cancer to the cæcum is exceptional. Twenty specimens of carcinoma of the cæcum were examined, and in only one case was it possible that the tumour could have started in the appendix, and the origin was doubtful even in this case.

Diverticulum of the appendix was present in seventeen of the 5000 specimens. The condition was generally multiple. The largest diverticulum was  $\frac{1}{2}$  cm. in diameter. The protrusion is formed by an evagination of the mucosa and submucosa through the muscular coats. The wall of the diverticulum is thinner than normal. The only clinical fact of importance was that in 56 per cent. of these appendices acute appendicitis had developed.

JAMES M. GRAHAM.

#### KINKS AND ADHESIONS OF THE TERMINAL ILEUM.

Charles Mayo (*Surg. Gynec. and Obstet.*, March 1911, p. 227) emphasises the importance of examining the lower 4 inches of the ileum in all cases of gastro-intestinal stasis which are obscure in origin. In recent years he has noticed frequently the presence of a kink in the terminal end of the ileum, particularly in cases when the appendix had been diagnosed as the cause of the symptoms but found normal or associated with adhesions fixing the ileum.

Generally the ileum appears to be rolled over and fixed to the mesentery by adhesions of inflammatory origin. Sometimes, however, the bands are of a congenital nature, as they occur in children with no trace of inflammation. The appendix is sometimes the obvious source of the adhesions. Arbuthnot Law believes that the condition may be due to ptosis of the loaded cæcum with stretching of the peritoneal coverings and development of bands in the lines of traction. The ileum is thus kinked a few inches from the ileo-cæcal valve, and may become fixed to the peritoneum beneath it. It is not always possible to differentiate the symptoms from those due to disease of the appendix, as the conditions are frequently combined. The region of the kink is usually tender from the umbilicus downwards to the right. The pain is increased by peristaltic activity. In some cases there is chronic constipation and also alternating constipation and whites. The intestinal and stomach symptoms are generally most marked at regular intervals after meals, and frequently there is distension of the small intestine, especially when the patient is fatigued. The treatment consists in dividing all the confining bands and in preventing new adhesions by adjusting the peritoneum with sutures. The application of sterile vaseline over the peritoneal surfaces has also proved useful.

JAMES M. GRAHAM.

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## DISEASES OF CHILDREN.

By G. H. MELVILLE DUNLOP, M.D., F.R.C.P.,  
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### EPIDEMIC POLIOMYELITIS. .

THE recent epidemic of poliomyelitis in Nebraska demonstrated beyond a doubt that in the epidemic variety of the disease many cases exhibited merely a temporary inco-ordination of muscle groups, while others showed absolutely no indication of motor involvement. Cases of this description occurred in families where there were the same symptoms in other children followed by paralysis, thus leaving no doubt as to the diagnosis. Cases of this type occurring at any other time than during an epidemic would be impossible to diagnose. Sometimes the symptoms are so mild as to suggest a mere cold or gastro-enteritis, and in the absence of paralysis would lead to no diagnosis did they not occur during an epidemic, but it has been clearly established that in many cases there is no paralysis but yet the case has proved to be one of poliomyelitis. In more severe forms we meet with cases of the cerebral, the bulbar, the neuritic, and the typhoid types: these may dovetail into one another, giving rise to great difficulty and confusion in diagnosis.

The meningeal type presents symptoms of tuberculous or cerebro-spinal meningitis, and simulates these conditions so closely that without an examination of the spinal fluid a diagnosis is impossible.

The bulbar type presents as a rule a patient with great prostration. This may come on within twenty-four hours or may follow a more general paralysis of arms, legs, or other segments. These cases are the fatal ones during an epidemic, as the involvement of the pneumogastric usually foretells death. The patients lie quiet and peaceful, with a high temperature and shallow abdominal respiration. The thorax is barely seen to move, and death is caused by asphyxiation.

The neuritic cases have the symptoms of a peripheral neuritis, and suffer great pain along the nerve trunks and into the posterior root ganglions. There is excruciating pain on movement of the limb and extreme tenderness on pressure.

The typhoid type runs a temperature for ten days or two weeks after the paralysis has ensued, and falls by lysis. The tongue is dry and coated, and there is headache and prostration.

Polio-myelitis is generally recognised as a disease of infancy and childhood and with a very low mortality, but in the Nebraska epidemic more than 50 per cent. were over 10 years, and there was quite a respectable mortality. In a large percentage of cases more than one child in the family was attacked by the disease. Eighty-five per cent. of the cases fully recovered, some quickly and others gradually; about 10 per cent. made partial recoveries, and 5 per cent. made no perceptible improvement.

There seems to be no sure way, apart from electrical reaction, of prognosticating which cases will recover speedily and which will drag along. In general, fatal cases are more fulminating, there being greater prostration, more general paralysis, ending in bulbar involvement and death (*Pediatrics*, August 1910).

#### ENLARGED THYMUS.

The occurrence of an enlarged thymus gland has long been recognised in cases of sudden death when the post mortem examination reveals no obvious cause. There is sometimes a history of attacks of laryngismus stridulus, and in most fatal cases an enlarged thymus is found at the autopsy. There is often, however, no history of illness at all, the child becoming suddenly cyanosed and falling dead in the midst of its play or in its mother's arms.

The pathology of the condition is still very obscure, and two rival theories have to be considered. The mechanical explanation owes its suggestion to Grawitz, who supposes that death is caused by pressure of an enlarged thymus on the trachea. Flattening of the



trachea has been described in some of the cases, but it has been proved that flattening may be produced in perfectly normal cases in the cadaver by letting the head fall backwards. It is scarcely conceivable that an enlarged gland should be able to produce such gross mechanical effects. Another suggestion is that the pressure acts on the vagus nerve and gives rise by reflex action to spasm of the glottis.

According to these theories death ought to occur from asphyxia, but in the few carefully observed cases death has been due to cardiac failure. A more generally accepted theory propounded by Paltanuf is that an enlarged thymus is not regarded as the cause of death, but only as a sign of a general constitutional disorder, to which the name of lymphatism has been given, and which is characterised by an enlargement of the lymphoid tissues through the body. In particular, the spleen is enlarged, the lymphoid tissue of the intestines, the tonsils, and the adenoid tissue of the tongue and pharynx also show enlargement. Granting the above definition, we are still in the dark as to why the subjects of this condition die suddenly. The microscopical examination of the organs has shown no great departure from normal. It seems likely that there is some error of metabolism leading to the formation of substances which have a depressive and toxic action on the heart. Blumer has suggested still another more complicated explanation of the toxæmia which is supposed to exist. In the spleen and lymphatic glands which he examined he found degenerative changes in the germ centres of the follicles. He thinks the lesions bear a resemblance to those produced by Flexner by injecting toxic sera into guinea-pigs. He believes, therefore, that in status lymphaticus a condition of lympho-toxæmia may exist.

The view that in these cases of lymphatism there is some error of metabolism connected possibly with an internal secretion of the thymus gland receives support from the fact that persistent thymus is found not uncommonly in two other diseases associated with disturbances of internal secretion, viz. exophthalmic goitre and Addison's disease. The association is too frequent to be explained as a mere coincidence. Mair, the author of the paper under review, states that in two hundred and seventy post-mortem examinations on children he had found the thymus enlarged in eighteen cases. In seven of these cases other signs of status lymphaticus were present, but in only two did death occur suddenly without obvious cause. In one of them the heart was pale in colour and presented a mottled appearance, suggestive of fatty degeneration. On microscopic examination the heart showed large areas of degenerative changes, corresponding to the waxy degeneration of Zenker. The degenerated fibres showed irregular swellings in which the normal

striation had completely disappeared. In addition to other changes in the heart muscle small areas of fibrosis with round-celled infiltration were found. In the centre of some of these areas remains of muscle fibres in a necrotic condition were seen. Paltauf has already described similar degenerative changes in the heart muscle in some of his cases, and the writer suggests the possibility of these degenerative changes being responsible for the sudden deaths that occur in lymphatism (*Med. Chron.*, January 1911).

#### THE PLANTAR REFLEX IN INFANCY AND CHILDHOOD.

The great variability of the plantar reflex phenomenon during infancy and childhood induced Fleischner to examine a series of five hundred cases, to determine, if possible, the exact status of the reflex and of the value of the Babinski phenomenon during this period of life. For the purpose of noting the results obtained the cases were divided into groups according to age. The first group contained one hundred and sixty-seven babies from birth to 5 months. In one hundred and forty-seven of these there was extension of all the toes, the reaction was very quick, and the large toe responded more briskly than the others. In seven babies there was no response, and in the remaining six the response was very variable. Sixty-two children up to 9 months old were contained in the second group, of whom only five were able to stand. All those who could stand gave extension and abduction of the toes. Of the fifty-seven who could not stand forty-seven gave the reaction that was observed in the younger babies, while the other ten gave variable results. In the third group were included fifty-five babies up to a year old. Twenty-eight of them could not stand, and gave the characteristic infantile response. Of the remaining twenty-seven only three well-developed children responded with flexion of the toes when either side was stimulated, the others giving extension on stimulation of the outer side and flexion on stimulation of the inner side of the foot. The fourth group included sixty-seven children between the ages of 1 and 2 years, of whom eighteen were unable to stand. Only eight of these eighteen showed the usual infantile reflex, the remaining ten showing either extension and abduction or flexion and adduction according as the outer or inner side of the foot was stimulated. Of thirty-four babies who could walk seventeen showed the characteristic adult reflex, two the infantile, and fifteen showed extension on external and flexion on internal stimulation. The fifth group included one hundred and three children between 2 and 5 years, all of whom were able to walk. Fifty-four gave the adult response flexion and adduction, most marked in the smaller toes. Thirty-eight gave extension on external and flexion on internal stimulation. Fifty-nine gave the infantile response, and six did not

respond because the feet were very cold. It will be seen that the results bear a certain definite relation, first to whether or not the babies could stand or walk, and secondly to their age. Considerably over 80 per cent. of the children under a year unable to stand showed the typical infantile response. Of the infants who could walk 5 per cent. showed the infantile response, 40 per cent. the mixed reflex, and 55 per cent. the adult reflex. It further appears that during the period of childhood in which babies are passing to the condition of walking, *i.e.* to the period in which they can stand, an infantile adult reflex is present: by this we mean that extension and abduction take place when the outer edge of the plantar surface is stimulated, whereas flexion and adduction occur on internal stimulation.

The chief conclusion arrived at in the paper is that the Babinski phenomenon is practically of no value in infancy when the children cannot walk, and is then only of value if one is cognisant of the reflex present before the diseased process began (*Arch. of Ped.*, August 1910).

#### TREATMENT OF A SYPHILITIC INFANT BY ADMINISTERING "606" TO THE NURSING MOTHER.

A young woman, aged 19, suffering from syphilis was treated at the skin clinique at the University of Freiburg for specific skin eruptions and large masses of condyloma of the genitals. The Wassermann reaction was positive and spirochaetes were numerous. She was confined on the 4th July of an infant weighing 2400 grms., and having a wrinkled and somewhat shrivelled appearance. No specific symptoms manifested themselves until the 12th July, when numerous bulle of pemphigus made their appearance, chiefly on the soles of the feet, and syphilitic onychia developed round the finger nails on each of the hands. Owing to the tendency of other specific symptoms to develop, it was decided to subject the nursing mother to treatment by "606." Accordingly injections of 0.3 g. of arsenobenzol in an aqueous solution were made in both buttocks. Characteristic reactions followed these injections, but on the third day there was commencing diminution of the size of, and of the discharge from, the condyloma of the mother, and disappearance of the spirochaetes. On the tenth day the Wassermann reaction was still present. On the first and second day of the treatment of the mother there was an augmentation of the symptoms from which the child was suffering, but by the end of the third day further development was arrested, followed by a sudden attenuation of all the symptoms. By the fifth day the copper colour of the skin was giving place to a more healthy tint. Disappearance of the onychia and of the pemphigus blebs followed, although there was still visible some marginal scabs of the dried-up vesicles. While at

first the child was unwilling to seize the nipple and cried continuously, it now emptied the breast at each repast. By the 29th of July the child weighed 3900 grms., and presented none of the specific symptoms. It would appear from the foregoing statement that the treatment of the mother by "606" was instrumental in curing the child, though no trace of the remedy could be discovered in the samples of the mother's milk which was carefully analysed during the progress of the case (*Münch. med. Wochenschr.*, 1910, lvii. 1725).

## DISEASES OF THE EYE.

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### TACT A DISTANCE—THE SENSE OF OBSTACLES.

IN a series of articles of much interest, extending through the latter half of last year (1910), and published in *L'Ophthalmologie Provinciale*, M. Kunz, who as director of a large blind asylum has enjoyed exceptional opportunities to study the matter, and is in a position to speak with authority, discusses this "sense." It has been variously designated *tact à distance*, the sense of obstacles, and the blind man's sixth sense, and, as we shall see, is possessed by different persons to a very varying degree. The term has, unfortunately, been used with too great laxity to mean three different things, viz. (a) the tactile impressions proper, which are received upon the uncovered skin of the face, excluding all other senses; (b) the same *plus* the sense of hearing; and (c) the sense of all the impressions, tactile, auditory, olfactory, which, in the blind particularly, are of such value in enlightening the intelligence as to objects and obstacles.

He disapproves of the two expressions, sense of obstacles and blind man's sixth sense, in the first place, because it is not a separated and differentiated "sense" at all, and because, as we shall see, it is not confined to the blind or present in more than a percentage of them. Some people appear to imagine that when vision (or some other power) is lost a new "sense" springs into existence to compensate for that which is lost—a total delusion. Further, so far from one sense taking up the function of another which is lost, the contrary rather is the case. Thus it is well known now that among deaf mutes the acuteness of vision more frequently than not is lower than the full amount, though on the "vicarious" theory it ought to be greater; it has been shown, too, that their tactile sense is less acute. And again, it has been proved that the tactile sense of the blind, especially in the hands, is distinctly inferior to that of seeing persons. The unwary observer, when he sees the blind man reading with his fingers, is apt to be



misled into supposing him to have extremely fine sensations, but experiments with the aesthesiometer show that the finger-tips of the blind man have *less* acuteness than the normal average. As a matter of fact the finger-tips of a blind reader become callous and less sensitive—the very circumstance which enables him to read. The normal person's acuter sense causes him to compare the letter actually being read with the outline of the neighbouring ones, while the duller fingers of the expert blind man receive impressions from the actual letter alone which is under examination at the moment. To this point Javal has contributed some remarks in his book *Entre Aveugles*, now translated into English. As a matter of fact the "reading finger" of a blind person is sometimes to his own knowledge less sensitive than are his other fingers, and frequently enough he will employ the others rather than the reading finger to tell the difference between samples of cloth, etc.

We are all familiar with the wonderful legends regarding the powers said to be displayed by the blind—powers of interpretation, even the decision of colour, by means of the finger-tips—but these must be relegated to the place for fairy tales: they are quite mythical. M. Kunz, who has had much experience in matters of the kind, brings an interesting proof of his contention that the tactile sense of the sighted is superior to that of the blind. He has constructed and brought out an atlas for the blind consisting of some 320 parts, in which by means of raised lines, etc., he displays for their benefit the mountain ranges, coast lines, course of rivers, etc. At first, acting on the prevailing idea, he made these river lines just such as he could identify of himself, assuming that if he could distinguish them the blind could assuredly do so, but on putting the matter to the actual test he found that those lines were too fine for those for whom they were intended, that he had expected too much of them, that in fact the tactile sense of the finger-tips was on a lower plane in the blind than in the sighted. He had to make the lines indicating rivers such that he could himself distinguish them while wearing a glove before they were found to meet the requirements of the teachers of the blind. Of course this is without prejudice to the commonplace fact, that the information which one is in the constant habit of receiving and interpreting means more to him who has to do with those particular matters than the same amount of information, or even more, would do to one who is not in the constant custom of noting specially these impressions: the psychological value, in other words, may be higher though the physiological quantity is less.

In passing he notes further that the sense of touch includes two powers—the sense of extension, or touch proper, which is measured by means of the aesthesiometer, and the sense of pressure or intensity—the two are not identical. Without going into details, it may be said that the parts which excel in the former quality, such as the tips of the

fingers and the lips, do not show the same pre-eminence in the latter; thus the forehead, where extension-sensation is very poor, shows an intension- or pressure-sensitiveness far higher than do the lips. As a matter of fact this sense of obstacles—a form of tactile sensibility—in whatever person it is present, whether blind or seeing, has its seat in the upper region of the face, and is neither confined to the blind nor developed in all of them. It is oftentimes a facial or cutaneous sensation, compounded of tactile sensation in the forehead, round the eyes and in the auricles, and of hearing.

If one is plunged into an unknown and dark place one will employ all the remaining senses to make up as far as possible for the lost sense of sight. One will listen intently to any sound, even to the noise of one's own footfall, the sound of one's voice; one will accept readily the evidence obtained by the sense of temperature, of smell, etc., which will help to decide whether one is in the open, in a cave, or a room. The touch of hands and of feet will give assistance, too; one will learn whether it is a wall or an article of furniture which one touches. All these senses go to make up the sense of obstacles, using the word in the widest sense, which is a different thing from the faculty of orientation, properly so called. A blind man may possess the former and not the latter, or *vice versa*. The chief element in this sense of obstacles is unquestionably hearing. As one, for example, walks along a corridor and approaches the end of it, one hears the tone of the footfall change, one may note the change, too, as one passes a doorway, whether closed or open, etc., etc. Conversely, a blind man who has been accustomed to finding his own way about is rendered almost helpless by a snowfall, for the sound of his footsteps, etc., is lost. Were one to attempt to guide oneself by the distance-sense alone, and not by means of hearing, an approaching vehicle would have run one down long before that sense (of distance) gave warning of its presence, even to one who possessed it in a high degree; hearing is of vital moment taken in connection with it.

By means of a long series of patient experiments and observations Kunz has firmly convinced himself that the true distant touch (*le tact à distance*) is independent of the acuteness of the sense of hearing. A musical ear is a valuable asset for the purpose of orientation, for it is quicker than the unmusical to detect alterations in the sound of the footsteps or the voice when one approaches a wall or obstacle, but with the integrity or development of the sense or faculty of distant sensation the functions of hearing have nothing to do. If they had, then blind musicians would have this sense to a large degree, but as a matter of fact they are no better than other people, and Kunz actually had one blind deaf mute who in this faculty excelled any of the musicians whom he examined.

The care and thoroughness with which Kunz has gone into all

these matters is well illustrated in connection with the next point to be noted, viz. the ability to localise a sound, to indicate the region from which a sound comes. It is often taken for granted that the blind are superior in this faculty to the seeing, but, as he points out, in the case of the seeing the immediate step is taken of correcting the observation by another, of checking the possible error of hearing by means of sight, while the blind never can do that: he therefore goes on in ignorance, or as Kunz puts it, "his school exercises are never corrected." He therefore examined a number of blind and a number of sighted persons, avoiding any bias in the selection, save to insure that in the individuals of each group the hearing was good in each ear. Each group was tested thirty-six times thus: the person was placed at one end of a ten-foot table which he was not permitted to touch, at the other end sat Kunz, who had under command a tuning-fork, which he could place at either of two marked points, situated a certain distance apart, to right and to left. At the first six tests both ears were open, at the second six one ear was closed, at the third six the other ear was closed, always with the patient's face directed towards Kunz. The same process was gone through eighteen times with the patient's back towards Kunz. All the patient had to do was to indicate whether the sound came from his right side or from his left. When he came to make up his results he found that three blind persons were right twenty-six times (out of thirty-six), three more twenty-five times, and six never once. Of three sighted one was right thirty-five times, one thirty-one times, and one twenty-eight times. The mean of the three first sighted was thirty-one: the mean of the three first blind was twenty-six. The lowest record for a sighted person was fifteen (out of thirty-six), while six of the blind were never correct once. When facing forwards and with both ears open three of the blind and five of the seeing persons made no mistake. These observations appear to show pretty conclusively how absurdly inaccurate it is to assume that the blind have superior auditory localisation to the sighted.

Kunz went on later to certain further experiments in this relation in order to find the minimum angle under which correct localisation could be depended upon. For this purpose he chose six typical individuals, all of whom had been blind from childhood: three of these possessed the *tact à distance* to a high degree, the other three, young adult women, could hardly be said to be endowed with a trace of it. Unless the distance between the two positions for the tuning-fork exceeded 12 cm., corresponding to an angular separation of 40° 36', not one of the persons could be depended on, and although two of them at least had loudly proclaimed their belief in the "natural superiority" of the blind, the average separation required was 40 cm. or 15° 30' before they could tell that the second position of the fork was

more to right or more to left. One of the patients, who had been thirty-one years blind out of thirty-seven of her life, required a separation of actually 80 cm. (36"). Another point of interest about these tests with the tuning-fork was that it made but a very small difference in the percentage of correctness of answers whether the fork was in front of the patient or behind him, whereas to the obstacle sensation the position makes an immense difference.

When passing by the side of large objects, such as a wall or a tree, the person may receive sensation by the currents of displaced air reflected from the object, the current affecting the sides and back of head and neck: girls with "hanging" hair who were tested never felt this reflected current. It follows from the above that the faculty of localisation, as tested by the methods mentioned, has no relation to the *tact à distance*, which depends neither on the acuteness of hearing, nor upon a musical sense, nor upon the conduction of sound by the cranium, nor upon localisation by hearing.

So far our knowledge of this sense of obstacles has been purely negative: we know what it is not, but not what it is. No such organs being located in the skin, it must surely be of the nature of the tactile sense. We are satisfied that it has to do neither with sight nor with hearing. But the skin possesses various "senses," and at certain parts is more sensitive to one stimulus than at another: thus certain regions are more sensitive to temperature changes, others to pressure or to pain. If this distant touch be of the nature of a temperature sense it ought to be most acute in those who are sensitive to temperature changes. To test this Kunz examined a score of persons, some blind and some not, by means of two vessels containing water kept respectively at 46° and 46·3 C., to ascertain whether those endowed with this peculiar sense were any more quick to discern slight differences in temperature than others. He could not satisfy himself that they were: there was certainly no distinct difference between them and others. Theoretically, too, the greater the difference in temperature between the human body and surrounding objects the more acute this sense ought to be, but it is not. In testing this point Kunz employed discs of glass and of felt which in cold air, agreeing in temperature as they must with other surrounding objects, might be 33 to 35° below that of the patient. But in that temperature the range of *tact à distance* so far from being high was very low, and increased by 50 or even by as much as 70 per cent. when the temperature of the air rose to something like that of the body. Blackening the face with lamp black and thus rendering the skin more susceptible to heat rays actually diminished the activity of the peculiar sense, which became indeed more acute when the face was powdered with a dusting powder, though the skin is of course rendered less sensitive thereby. Kunz surmises that perhaps the temperature sense may co-operate in this way, that when, for example, one is in the neigh-



bourhood of a cold wall or cold window evaporation becomes less, perhaps because the chilled air in front of such an object descends and makes its presence felt upon one's forehead, etc.

There remains, then, as an explanation of the chief vehicle of this peculiar power, the sense of touch. This ought to be divided into a sense of *pressure* or intensity, and that of *extension* or of touch properly so called, *i.e.* the faculty of realising that two or three impressions simultaneously perceived are two or three discrete points, and that of appreciating their separation.

The minimum pressure perceptible can be tested by means of special balances or the regulated touch of a single hair. The minimum distance which must separate two points, such as those of a letter of the Braille alphabet, in order that they may be perceived as two discrete points—the threshold dividing perception of two as two from perception of two as one—can also be ascertained by simple means, and here again Kunz endeavoured to trace relationship between the tactile sense, especially of the face, and the sense of obstacles, but here again he was baffled, for he could not discover that there was any at all. There now remained only the question of pressure.

A body in motion must displace air: in front of it there must be a wave of condensation. If in front of it the road is clear equilibrium is quickly established, less quickly if there is an obstacle before it. Now it is quite conceivable that a sensory apparatus of high excitability might be conscious of the varying resistance in the air-waves thus produced by the movement of the person and the reflected waves from surrounding objects. The tympanic membrane in particular, which is free from interference by muscles, is peculiarly sensitive to such waves of condensation and rarefaction, though it can do little in the way of localising them. In addition the hairs of the eyelashes and eyebrows act as minute levers of unequal arms, the long arm being, of course, the exposed portion, and there being many of these the effect is multiplied. Also Kunz had found, as noted above, that some who possessed this distant touch when walking, provided that, in the case of girls, the nape of the neck was not covered by the hair, and could become aware of the presence of an obstacle, were yet unconscious of anything when a glass plate, etc., was brought near to them: he thinks the short hairs on the nape of the neck may, perhaps, be stimulated by the currents of air as they re-unite behind the head of the moving person, and these currents would be altered by the existence of any large fixed object. It became important therefore to ascertain to what extent the persons endowed with the distant touch possessed a pressure-sense superior to that of others. To test this he chose hairs from various sources and various animals which he placed in a series I. to VIII., I. being capable of 1 mgrm. of resistance, then 2, 3, 10, 20, 100, 500 mgrms. respectively. He selected further twenty portions of skin,

such as forehead, back of neck, lips, tip of nose, &c., and noted carefully the minimum strength of hair which was required to evoke sensation in the skin of each of these areas when gently pressed against it. Almost every person tested could perceive No. I. upon the eyebrows, eyelashes, and in the ears. M. Kunz gives a most elaborate series of charts showing the sensitiveness, in a number of different individuals, of the various areas to the hairs of the eight series. Some of his conclusions are very striking. All the persons, whether seeing or blind, who were sensitive to hair No. I. upon the forehead (1 mgrm.) possessed to a greater or less degree that distant touch of which he has been writing. Those on whose foreheads sensation was only aroused by hairs II. or III. either did not have it at all, or showed mere traces of it, provided the sensitiveness of other parts sufficed to compensate for the relative dulness of frontal excitability. In a few instances the patients were possessed of higher sensitiveness on one side of the forehead than on the other, and when that was the case they either showed *tact à distance* on the superior side only, or were very uncertain in their localisation of the obstacle perceived. As showing the effect upon the distance touch of the least reduction of sensation (indicated by the fact that it existed to any important degree only if the finest hair was perceived), Kunz records further that if the forehead was moistened with a watery solution of cocaine or codeine the reduction in sensitiveness (not amounting to real anaesthesia) was such as to lower by 30 to 60 per cent. the activity of the obstacle sense.

On these grounds chiefly, then, Kunz attributes the *tact à distance* to the activity of the pressure sensation, without desiring to minimise the effect of temperature and even of any possible radiations as yet undiscovered. If temperature enters into the matter at all its influence may be excited first through such air currents as have been spoken of.

It is plain, then, to sum up Kunz's views, that the sense which we have variously termed sense of obstacles and distant touch (*tact à distance*) has nothing to do with hearing, but is tactile; its end organs are in the skin, and it is connected with the sense of pressure. To call it the blind man's extra sense or sixth sense is absurd, because—apart from other matters—it is frequently possessed by those who see quite well, though the owners of it are often quite unaware that they possess it, and because many blind persons have not a trace of it. The sense is absolutely independent of sight as such. Kunz thinks that ophthalmia neonatorum and certain diseases of the skin have a tendency to produce the hyperaesthesia which lies at the root of this "sense"; and in former days, when among the blind the proportion caused by such affections stood very high, the proportion of the blind possessing this faculty was naturally high also, but with the improvement of hygiene and of antiseptics the number of cases of acute purulent ophthalmia has

been diminishing relatively to accidents, etc., and the relative proportion of blind with this power to blind without it is becoming lowered accordingly, until by and by there will be no serious difference in incidence among the seeing and among the blind.

## DERMATOLOGY.

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### ON IMMUNITY IN MULTIPLE HERPES ZOSTER.

ZOSTER, which is now regarded as a specific infectious disease, conferring protection from subsequent attacks in the large proportion of cases, has among its clinical characteristics an almost constant limitation to a single nerve territory, and yet the general symptoms, so frequent at its prodromal and eruptive periods, point to a more or less extensive toxi-infection. Multiple zoster is very rare, and generalised zoster quite exceptional. The observation of Fournier of zoster with a hemiplegic distribution is, we believe (Gougerot et Salin, *Gaz. des hôp.*, 17th November 1910, Paris), a unique one. All the same, one sometimes sees, in association with a classic localised zoster minute aberrant vesicles, isolated, or in small groups, disseminated over the skin. Localisation to one nerve territory is the rule, multiplicity of location the exception. This fact has suggested the hypothesis of a progressive auto-immunisation to explain the ordinary restriction in area. While there are cases where the multiple localisations appear in a single outburst, it is more common that secondary eruptions come out at an interval of several days, and the second and third manifestations are of feeble intensity. This was exemplified in a recent case at the St. Louis Hospital in Landouzy's wards, where after general malaise and polyarticular pains those latter localised themselves in the right thigh, on the outer aspect of which a very intense eruption of large grouped vesicles developed, though at first no aberrant blisters were found. Two days later there were pains in both forearms, extending to the wrists and hands, but much less severe than those experienced on the thigh. Vesicles linearly arranged, though smaller than those of the first eruption, came out on the extensor aspect of the arms, from the elbow to the little finger, and about the same time a small group of vesicles appeared near the right mamma. By the end of the sixteenth day the patient was well enough to leave hospital, though still complaining of some pain. While the first zona evolved according

to the classic type, the second was abortive in character, and had there not been a systematic examination the eruption would have failed to attract notice. This attenuation in the case of the secondary cutaneous manifestations suggests to the writers the hypothesis of an auto-immunisation in zoster. If one admits this hypothesis of a rapid and complete, or at least sufficient, immunisation in course of several days, it is possible to understand how the virus of zoster, when it is diffused, encounters refractory nerve territories and cannot further create another localisation. The same thing holds in vaccination and variolisation, ten days after a first successful inoculation a second does not take effect. This electivity of zoster for a single ganglion and a single posterior nerve root may be compared with the electivity of lepra, of syphilis, and of diabetes for the ulnar nerve, of lead for the radial, of the gonococcus for the sciatic, etc. This immunisation takes time to become perfect, and infection may occasionally extend to territories still incompletely protected. Should the infection spread in the first three days of the pre-eruptive period, multiple zoster ensues. If it spreads later the zoster is still multiple, but the secondary eruptions are more and more attenuated. A remarkable clinical fact is that in the case cited the fresh localisation did not affect nerve territories close to the first, but "jumped," as it were, some distance. In future it should be noted when successive manifestations showed themselves, their degree of intensity, if bilateral, and whether simultaneous or not.

#### IMPETIGO CONTAGIOSA OF THE MUCOUS MEMBRANES.

It is somewhat singular that while impetigo contagiosa is a complaint very frequently encountered, yet its occurrence on mucous membranes is rarely alluded to. Montgomery (*Journ. Cut. Dis.*, September 1910, New York) has had his attention directed to this circumstance by meeting with a marked example in practice. A man of 35 had had for three weeks what he regarded as a "cold sore" at the right corner of the mouth. The eruption subsequently spread to the right cheek and right side of the neck. In addition to this, when seen, the nostrils were intensely red, crusted, and discharging an acrid serum. He had also conjunctivitis of the right eye, accompanied by pronounced congestion of the eyelids. He could scarcely talk for fear of dragging open the cracks at the angle of the mouth. The crusts in the nose interfered with breathing, and the state of his eye gave him much annoyance. His throat became sore and reddened, apparently due to extension from the nose. The treatment which was most efficacious in curing him consisted in dusting powdered calomel into the eye three times a day; the nose was douched with an alkaline antiseptic solution, which was also used for the mouth and throat. A paste of starch and oxide of zinc, each one part, and naphthalan two, was



applied at night, wiped off with olive oil in the morning, and replaced, as less noticeable, by a little red oxide of mercury ointment in the daytime. (Naphthalan consists of from 96 to 97½ per cent. of a crude naphtha, distilled from a spring in the Caucasus, and anhydrous soap.) His statistics show an involvement of the mucous membranes to some extent in about 11 per cent. of cases of impetigo contagiosa, and almost entirely in those of the better rank. The edges of the eyelids and the conjunctiva, the lips and mouth, suffered most frequently; in only two were the nostrils invaded. "Perleche," described by French authors as a separate disease affecting the corners of the mouth, is only impetigo contagiosa in this situation.

#### DERMATITIS EXFOLIATIVA TREATED BY QUININE.

Mook refers to a former paper on this subject (*Journ. Cut. Dis.*, September 1908, New York), where he reported four cases of dermatitis exfoliativa and two of pityriasis rubra (Hebra type) treated by the administration of large doses of quinine sulphate. The results were prompt and satisfactory. He now (*ibid.*, September 1910) relates a seventh instance. Mrs. R., 63, had always been very healthy. Her skin affection began, she thought, about two years previously as a general pruritus, but with no visible lesions. This was followed by oedema of the hands, feet, and legs, accompanied by diffuse redness. This latter symptom became universal and was succeeded by exfoliation of large and small flakes of epidermis. When seen on 1st July 1909 the whole surface was bluish-red, oedematous, covered with large and small closely and loosely adherent scales. On the legs and arms there were areas from which serum constantly oozed. The hair was almost entirely gone from all parts; that remaining was thin, fine, and dry. Perspiration had quite stopped a year before. The nails were pitted and corrugated. She had frequent chilly sensations, and required artificial means of warmth even in hot weather. She was drowsy and experienced intense pruritus at times. She had lost thirty pounds in weight, though appetite and digestion were good. Five grains of hydrochlorate of quinine, as being more soluble and thus more readily absorbed than the sulphate, were administered four or five times a day, without local treatment. In a month the profuse exfoliation had entirely ceased, the oedema had disappeared, and the chilly sensations were rare. Perspiration had reappeared: she was much less sleepy, and her physical condition had improved. The quinine was then discontinued for six weeks, and thyroid extract in half-grain doses three times a day substituted. Two weeks later the skin became reddened, oedematous, exfoliation reasserted itself, and in six weeks the relapse was complete. Rapid improvement was manifest in a few days after resuming the quinine. Three months later the skin was

practically well, and seven months after the treatment was begun it was perfectly normal. Her hair had grown as profusely as ever, and her health and weight were restored. Six months afterwards she remained well, though she had taken no quinine in the interval. The relapse under thyroid is worth notice, as this extract has been recommended by some authors in this and similar cutaneous states. The doses of quinine ought to be pushed to the limit of toleration, and continued till all trace of exfoliation has vanished.

#### THE ANTIPARASITIC ALCOHOL TREATMENT OF ECZEMA.

One of the most important of the advances in the management of eczema is a sequence of Unna's theory of its parasitic nature. The modern treatment of eczema consists in the combination of tissue and antiparasitic medication. Bockhart (*Monatshfte f. prakt. Dermat.*, 1st January 1911) observes that for evident reasons we are debarred from using watery disinfectant solutions. But though Unna thirty years since proved that almost all the microbes in the epidermis are destroyed by the intermittent application of alcohol, still this remedy has neither been so generally nor so methodically used as it should be. He has employed it in the treatment of eczema during twelve years, and always with good, frequently with surprisingly favourable, results. He avails himself of its disinfecting power in three directions: first, to destroy the bacteria and their toxins; second, to obviate complications with pyodermitis; and, third, to prevent recurrences. It has one invaluable property, that it exerts no injurious influence on eczema. While all our other agents in the treatment of eczema may, under certain circumstances, do harm, alcohol alone does none. No doubt there are contra-indications against its use, the chief one being the temporary though severe pain it occasions should the eczematous area weep or be eroded. He disinfects with alcohol every eczematous surface and the adjoining healthy skin, over a wide area, from the commencement of treatment till cure, and also for some considerable time after recovery. He treats so all varieties of eczema—the acute and the chronic, the seborrhoeic and the non-seborrhoeic—indifferently, unless in cases where there is great oozing, or should there be too many erosions, thus in general not the crusted and leeting eczema at its acme. He uses the 90 per cent. alcohol, sopping it on twice a day by means of a pledget of cotton-wool, removing any excess with dry wool in course of a few minutes. The dressing appropriate to the particular case is put on immediately thereafter. This intermittent disinfection with alcohol is pleasant to the patient and stills the itching. In particular, it has proved of especial value in eczema of the neighbourhood of the anus. Here in the thickened folded and fissured integument we find a very abundant bacterial flora, as staphylococci, streptococci,

and bacillus coli. So soon as the affected parts have been carefully disinfected with alcohol does the itching subside for considerable periods of time, and if the application be repeated several times a day it remains absent during the entire treatment. It has also a specially beneficial influence in preventing post-eczematous furunculosis, which is apt to be so troublesome in the later stages of improvement, very frequently showing itself when a course of treatment with tar is begun or being carried out. After cure the patient ought to persevere, even for months, with the application of alcohol, once daily, to the previously affected parts. The alcohol apparently acts best when used pure. The addition of resorcin, salicylic or carbolic acids, with a view to augment its efficiency, seems to lessen it, and the same may be said of combining it with iodine.

#### ALOPECIA AND SEBORRHOEA.

White (*Journ. Amer. Med. Assoc.*, 24th September 1910, Chicago) brings out two rather interesting facts from an analysis of 794 examples of these conditions observed in his personal private practice. One is that men are attacked by alopecia furfuracea much earlier than those of the opposite sex; the other, that women, as a whole, become the victims of alopecia, either simple or furfuraceous, more frequently than men. Dandruff is usually general in distribution, while alopecia is, as a rule, localised. Dandruff is frequently accompanied by subjective symptoms, and is often associated very strikingly with many changes in the texture of the hair as well as its loss. Seborrhœa may exist for years without entailing any appreciable loss of hair, nevertheless dandruff does seem to be followed or accompanied by alopecia twice as often as not. The drugs most successful in the treatment of dandruff and loss of hair are euresol—the mono-acetate of resorcin, and far less liable to cause irritation when used in full doses—combined with perchloride of mercury; and second to these tannic acid and chloral hydrate. The final results of treatment in these affections are almost disheartening, but, judged from a temporary point of view, good or a very good response can be expected in about 50 per cent.

#### RINGWORM AND ACNE.

One usually gains some hints of practical value from a clinical lecture by Dr. Abraham, and this experience is supported by one recently delivered (*The Clin. Journ.*, 8th February 1911, London). Speaking of ringworm, he says that in the majority of cases it can be cured within two to four months by the old-fashioned methods of applying germicides of various kinds, preferably in the form of ointments, which suit the greasy scalp better than watery lotions. The salve which he prefers is a 5 per cent. pyrogallic acid one, or one com-

posed of cuprate of copper, 2 to 4 drs., 1 dr. each of carbolic and salicylic acids, and an ounce of lanoline and vaseline in equal parts. These should be well rubbed into the patches night and morning, and smeared on the scalp generally. The hair to be kept short, and a cheap cap—destroyed by burning every few days—worn. X-rays should be reserved for obstinate cases which will not yield to such measures as those indicated, as with all precautions scarring and permanent baldness may ensue in some instances, while there may be recurrence of the ringworm. In acne there is probably something unhealthy about the tissues, so that the pus microbes or acne microbes, constantly present in them, evoke acne. While some cases of acne have cleared up like a charm under the new vaccine treatment, others have been made infinitely worse by it. Six of the most aggravated cases he had recently seen in private had had vaccine treatment from the best hands. It is still experimental and ought not to be indiscriminately used, or for mild examples, but reserved for bad cases which have resisted all other methods. He cites an instance where the patient, having only a few acne pustules, was submitted to the treatment by vaccines, and is now as much disfigured for life as if she had had bad confluent smallpox.

The opinion expressed by Abraham may, however, have to undergo modification when viewed in the light of the observations of Engman (*Amer. Dermat. Assoc.*, 1910). He says: Little can be said in favour of staphylococcus vaccine in the treatment of acne vulgaris. Some of the cases improve to a certain extent, to remain at a standstill, but, in brief, its treatment by suspensions of acne bacillus has proven, in our hands, since a proper technique has been adopted, the most brilliant agent we have seen in dermatology. There is only one drawback in these favourable cases, and that is, the lesions undergo such complete and rapid involution that deeper and more marked scars supervene. So by repeated large doses a mild case can be aggravated or converted into a severe one with large cystic lesions. Mild cases stand a larger dose than severe ones: in the latter continuous small doses give the best result. Full details as to dosage are laid down.

## NEW BOOKS AND NEW EDITIONS.

*Unsoundness of Mind.* By T. S. CLOUSTON, M.D., LL.D., F.R.S.E.  
Pp. 369. London: Methuen & Co., Ltd. 1911. Price 7s. 6d.

THE idea of writing a book chiefly for popular use seemed, when the proposal was first made to Dr. Clouston, a hopeless undertaking, and he declined it. Circumstances subsequently arose which induced him to reconsider his decision.



It was well that this was so. With all respect for his original unwillingness to perform the task, no one is more competent than Dr. Clouston is to discuss the many problems connected with unsoundness of mind in such a way as to make them understood not only by the medical profession but also by the intelligent layman.

A perusal of the work leaves no room to doubt that it will serve its essential purpose in an eminently satisfactory manner. It is free from technical terms, and is written in a forceful and lucid manner.

In an introductory chapter the popular conceptions of mental disease and defect are combated, and the unity of the functioning of all the organs of the body tersely described.

The apparent gulf which separates the functions of the highest nervous centres, those which are concerned with mental actions from those which can be studied by physico-chemical means, is not real, and is being rapidly bridged over as the result of accurate research.

The wide range containing on the one hand what may be regarded as sane conditions, and on the other hand the narrow range containing what may be regarded as defective, disordered, or diseased states, are fully discussed and graphically pictured in the first illustration. It may not be generally known that the mentally unsound form but a small part of the population, being 1 per cent. of the total number.

As a prelude to the inquiry into the general causation of unsoundness of mind the structure, mechanism, and action of the brain are shortly described. The direct causes of mental affections form the subjects of seven chapters, and the complexity of the question is shown by a concise example:—"A man suffering from unsoundness of mind may have a bad heredity, his general health may have been weakened, he may have been taking too much alcohol 'to keep himself up,' and lastly, he may have suddenly lost his fortune. It took all these causes acting together to upset his brain."

Special prominence is given to the chief rules of practice to be observed in mental hygiene. These are admirably stated and summarised in the chapter on heredity.

The subsequent discussion of predisposing causes is well worthy of careful study.

Efficient guidance is given through the maze of classification, and a praiseworthy line is steered between the extremes of psychology, which would divorce mind entirely from body, and psychiatry, which, without adequate investigation, would at once ascribe mental and bodily phenomena to be different aspects of the same ultimate cause.

The remainder of the book, with the exception of the last five chapters, is devoted to the symptoms and diagnosis of mental disease and defect, and to the consideration of borderland cases. The reader who wishes to pursue the subject further is amply directed. No

author of importance who has thrown light on symptomatological and kindred phenomena is omitted from the general survey.

The final chapters treat of certain general relevant facts and observations about unsoundness of mind, of its tragedy, and the effects of education, occupation, and social surroundings; then follows a picture of the sane ideal.

The author throughout the book sustains the reader's interest, and there are few who read it but will catch some of the enthusiasm and earnestness written on every page.

It is a work which should be in the hands of every medical man, and it is sure to find a wide audience in the general public.

The illustrations, fourteen in number, are excellent and pertinent, and the volume generally is a credit to all concerned.

*Text-Book of Nervous Diseases.* By Professor H. OPPENHEIM. Fifth Enlarged and Improved Edition. With 432 Illustrations and 8 Plates. Authorised Translation by ALEXANDER BRUCE, M.D., F.R.C.P.E., LL.D. Pp. 1424. Edinburgh: Otto Schulze & Co. New York: G. E. Steichert & Co. 1911.

WE heartily welcome this translation of Oppenheim's great work, the value of which is enormously enhanced, in this latest edition, by the introduction of numerous and carefully selected references to the literature of the subject. Needless to say, the subject-matter has been kept thoroughly up to date.

The translation is worthy of the original—one cannot say more in the way of praise. The work has not been in any way edited; the meaning of the text has been reproduced in English in a wonderfully exact and clear manner. It is a matter for great congratulation that this work of translation has been undertaken by such a competent and sympathetic hand. The English-speaking race already owed much to the translator for his brilliant and painstaking work in neurology; the debt has been greatly increased by his present labours.

Oppenheim's text-book is so well known and so highly esteemed that it is almost superfluous to say that it must be in the hands of everyone who takes any interest, special or general, in the study of nervous diseases.

*Vaccine Therapy; its Administration, Value, and Limitations.* A discussion opened by Sir ALMROTH E. WRIGHT, M.D., F.R.S. From the *Proceedings of the Royal Society of Medicine*, 1910, vol. iii. Pp. 216. London: Longmans, Green & Co. 1910. Price 4s. 6d. net.

FEW subjects have aroused more interest within recent years than vaccine therapy. This volume contains a statement of the views of

many of those who have specially devoted themselves to this branch of treatment. There is a general consensus of opinion as to the efficacy of staphylococcal, gonococcal, and *B. coli* vaccines, but with regard to the others, opinions are very various, and in some instances diametrically opposed to one another. The introducer of the discussion rather disparages the clinician's knowledge of bacteriology, and reserves the right of treatment by sera and vaccines to the bacteriologist. He makes some very astounding statements, some of them not strictly in accordance with the known facts in pathology. The claim that vaccines can effect the healing of large tuberculous ulcers without the production of a scar and with complete "restitutio ad integrum" betrays a lack of clinical knowledge. The smooth white skin remaining after the healing of an ulcer always shows very considerable departures from the normal when examined microscopically, or when regarded with respect to its power of resistance to injury, etc. With the statement on page 15, that "Pruritus ani is one of those disorders which the ordinary man would not think of referring to a bacterial infection," we quite agree. The association of furunculosis with pruritus ani, which misleads to the idea of its being an infective condition, is only what would be expected and what is found in any itchy skin condition. The fact also that in uncomplicated cases staphylococci and other organisms were obtained from the skin is not to be wondered at. Anyone who takes the trouble to examine the organisms found on the normal skin will at first be astonished at their variety and abundance. It is extravagant claims for the vaccine treatment which have all along done so much harm and delayed the wider use of vaccines as therapeutic agents.

The relative positions of the pure bacteriologist and the pure clinician were discussed by more than one speaker, and the need expressed for a better co-operation between these two classes of workers.

Taken altogether the volume gives a good idea of the present position of vaccine treatment, and will be read with interest by many, but except in the case of a few conditions, owing to the great differences in the results obtained by different workers, the reader is apt to be left very much in doubt as to the value of vaccines.

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*Diseases of the Spinal Cord.* By R. T. WILLIAMSON, M.D., F.R.C.P.  
With 183 Illustrations and 7 Plates. Second Impression.  
Pp. 432. London: Henry Frowde and Hodder & Stoughton.  
1911. Price 15s. net.

WE welcome this second impression of an excellent text-book on diseases of the spinal cord. It is an eminently readable work, and the illustrations are numerous and good. The preliminary chapters, on the structure and functions of the spinal cord, on general pathological histology, and on diagnosis and localisation of diseases of the cord, are

clear and to the point—not overburdened with too much detail. The grouping of the various diseases is simple and instructive, and each is dealt with in a most interesting, full, and up-to-date manner. Useful references to the most important articles and works are given, while the Appendix contains valuable notes on methods of pathological examination of the spinal cord.

In the Appendix to the second impression a short account is given of several of the most important advances which have been made in our knowledge of spinal diseases since the first impression was published in 1908. The chief subjects referred to are acute anterior poliomyelitis and the surgical treatment of diseases of the spinal cord.

Nervous diseases are apt to be looked at askance by the practitioner of medicine; they are relegated too often to the province of the “mere specialist.” Books like this of Williamson’s help to correct this fallacy, and we can heartily commend it to everyone whose interest and work lie in general medicine.

*Hay Fever and Paroxysmal Sneezing (Vasomotor Rhinitis).* By EUGENE S. YONGE, M.D. Pp. 150. 2 Coloured Plates. Edinburgh and London: William Green & Sons. 1910. Price 6s. net.

THIS book is well written and contains an excellent account of the literature of the subject. The author rightly lays stress on the irritability of the nerve centres or terminals and not on the presence of slight nasal abnormalities. The pathology, symptoms, diagnosis, and treatment of hay fever are all fully dealt with, and the volume gives evidence of considerable general reading and classical research. In the section on paroxysmal sneezing the author gives the results (favourable and otherwise) obtained by his operation—excision of the tubercle of the septum. The last part of the book deals with idiopathic rhinorrhoea: in the treatment of this condition the author recommends atropine and strychnine. There is a full index.

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*Diseases of the Stomach and Intestines.* By ROBERT COLEMAN KEMP, M.D., Professor of Gastro-Intestinal Diseases, New York School of Clinical Medicine. Pp. 750. 300 Illustrations. Philadelphia and London: W. B. Saunders Co. 1910. Price 25s. net.

WE have great satisfaction in bringing this exhaustive treatise on diseases of the alimentary canal before the notice of our readers. It is in every sense a practical work, and bears ample evidence that the statements made are based on extensive clinical experience as well as on a wide study of the literature of the subject. While the standpoint of the author is for the most part that of the physician, the ever-increasing sphere of surgical usefulness in gastric and intestinal disease



is by no means overlooked, and the indications and contra-indications for surgical intervention are clearly and logically explained.

The space devoted to a consideration of the physiology of digestion and excretion is scarcely proportionate to that allotted to anatomy, and while the recent investigations of Cannon and his co-workers are referred to, they do not receive the detailed consideration they deserve. Nor do we find the classic work of Pavlov utilised as it might have been. The clinical methods of investigating the functional activity of the stomach are fully described, and the various chemical tests are given in sufficient detail to render them practicable.

Having repeatedly tested the value of this work for purposes of reference we can confidently recommend it.

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*The Surgery of Childhood, Including Orthopaedic Surgery.* By DE FORREST WILLARD, A.M., M.D. (Univ. of Padua), Ph.D., Professor of Orthopaedic Surgery, Univ. of Pennsylvania, etc., etc. With 712 Illustrations, including 17 in Colour. Philadelphia and London: J. B. Lippincott Co. Price 28s. net.

THE surgery of children's diseases is an offshoot of general surgery which has made steady progress in recent years, and which, like other branches, has developed largely in the hands of the specialist. This is particularly the case in connection with orthopaedics, a subject now regarded in a department by itself, and on which many excellent treatises have been written. There are surprisingly few works, however, which deal with the general surgery of childhood, and there is no doubt that the volume under consideration fills a distinct want.

We can speak of Dr. Willard's book in terms of high praise. It is an authoritative work clearly and convincingly written, and embodying the results of a long and varied experience in the subject with which it deals. Though intended primarily as a reference work, to which the busy practitioner can refer, it contains much information which the student will find of value in connection with the examination of a little patient and the interpretation of the signs and symptoms of disease, while it further emphasises the importance of early recognition and early adoption of treatment.

It forms a handsome volume of over 700 pages, and is profusely illustrated. The illustrations, of which there are no less than 712, are a decided feature of the book, being largely reproductions of excellent clinical photographs collected during the author's practice. It falls naturally into two parts. The first, containing six chapters (225 pages), treats of general surgery of the different systems, while the second and larger part embraces orthopaedics.

Each subject is dealt with systematically, the etiology, symptoms, diagnosis and treatment being supplemented with a short account

of the individual pathology. In the first part, though necessarily rather short, the description of the surgical conditions are as a whole good, and contain much sound and practical advice. The chapter on appendicitis is excellent, as is also that on hernia, although in the latter, perhaps, the benefits of truss treatment are overrated. It seems to us a pity that in a book which covers practically the whole field of surgery, and in which are described the operative treatment of such conditions as harelip and cleft palate, hypospadias, extroversion of the bladder, that the treatment of so important and frequent a condition as mastoid suppuration and middle ear disease, should be dismissed in a few lines, with the advice to call in a skilled otologist. We note that the treacherous injections of air, saline, or oil find a place in the treatment of intussusception, while also that "vesical calculus is very common in children." Our experience of the latter condition would lead us to take a very different view.

The second part is in our opinion the better. It is well written, clear, and practical, and includes the whole of orthopædic surgery. It is in this branch of surgery particularly that the author enjoys a wide reputation, and his vast experience, coupled with his facile literary style, has enabled him to present a treatise on the subject deserving of much praise. Considerable space is devoted to the construction of children's hospitals and orthopædic gymnasia, while corrective exercises and mechanical appliances are fully discussed and illustrated.

The section on tubercular bones and joints covers 130 pages of the text. It opens with an admirable chapter in which are summarised the latest advances in our knowledge of surgical tuberculosis, and in which vaccine therapy, passive congestion, hygienic, protective, and operative treatment receive careful consideration. In regard to operative interference the author is frankly conservative, and except in the case of the elbow, advocates erosion of joints, repeated if necessary rather than primary excision. We venture to think, however, that properly executed excisions, especially in the case of the knee, give results which are infinitely superior to those obtained by incomplete erosions.

The skiagrams are numerous and good, while, as we have already indicated, the photographs illustrative of attitude, deformity, and effects of treatment do much to enhance the value of the book.

A bibliographical appendix and a well-arranged index complete what is a very sound and useful text-book.

*Hernia: Its Cause and Treatment.* By R. W. MURRAY, F.R.C.S., Surgeon, David Lewis Northern Hospital, Liverpool. Second Edition. Pp. 184. With 62 Illustrations. London: J. & A. Churchill. 1910.

THIS book has quickly gained a well-merited popularity, and in two years a second edition has appeared. It is one of the comparatively small number of monographs that deal almost exclusively with the author's personal experiences, and as such it is of extreme value to the operating surgeon. Mr. Murray is a strong supporter of Hamilton Russell's saccular theory, which postulates that a congenital sac is present in hernia in the umbilical, inguinal, or femoral region. In the present edition he brings forward additional evidence in support of the theory. This has already been referred to in this *Journal* (January 1911). As a logical sequence of his views his operative procedure is mainly directed to the obliteration of the sac. Many new figures have been added, and the historical introduction and the chapter on the geographical distribution of hernia have been retained.

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*The Fourth Era in Surgery.* By ROBERT T. MORRIS, A.M., M.D., Professor of Surgery, New York Post-Graduate Medical School and Hospital. Pp. 145. With 6 Figures. Philadelphia and London: W. B. Saunders Co. 1910. Price 6s. net.

IN this small volume are collected a dozen articles originally published in medical journals. The first era in surgery was the Hippocratic; the second was the anatomical upheld by Vesalius and other anatomists; the third was the pathological of Pasteur and Lister, and is the one now prevailing throughout the world; the fourth or physiological era is now dawning, in which the surgeon is only to turn the tide of battle, and leave the final victory to the natural protective forces of the patient. Speed, resembling that of Liston and of Syme, is the author's supreme deity, beside whom all gods are lesser gods. In that they retard manipulations and necessitate longer incisions gloves are not to be worn as a routine practice, but only under special circumstances, such as opening an uninfected knee-joint, doing a series of ward dressings, or operating on an uninfected patient soon after an infected one. Many other principles with which we agree are enunciated in the book, but each is clothed in such fantastic language as to make the reading somewhat irritating.

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*Movable Kidney: Its Etiology, Pathology, Diagnosis, Symptoms, and Treatment.* By WILLIAM BILLINGTON, F.R.C.S. London: Cassell & Co., Ltd. 1910.

THERE is nothing original in this work, and under the various headings of the title we only find a *réchauffé* of the views which have been put

forward to explain the production of nephroptosis and its consequences during the last decade. The author has had, however, a large experience in this affection, and has been associated with Dr. Suckling, so that there need be no surprise in finding him to be a believer in the mental and nervous disturbances said by that author to result so frequently from mobile kidney. It is pleasant to find that Mr. Billington does not think operation needed in every case of renal mobility, and that many of his patients have not been operated upon. He describes an operation which he has found to be efficient, and states that he has operated upon 230 patients and anchored 350 kidneys with success by the method he advocates.

### NOTES ON BOOKS.

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IN *A Guide to the Preservation of Health in West Africa* (Constable & Co.) Dr. Henry Strachan, C.M.G., gives practical directions written in the simplest language, devoid as far as possible of technical terms, by which persons living in West Africa may be assisted to preserve health and avoid disease. The subjects treated include antimalaria precautions, the collection and storing of drinking water, the effects of sun, care of the digestive system, and general sanitation.

In a small space the author presents much valuable information. We would recommend anyone proceeding to West Africa, or to any tropical country, to include the book in their outfit.

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A perusal of *Serum and Vaccine Therapy*, by Professor R. T. Hewlett, M.D. (second edition) (J. & A. Churchill), leaves the impression that Professor Hewlett's treatment of the subject is lacking in distinct definition. The work contains a great mass of information, but no goal is reached; the constituent branches of the subject come to an abrupt and premature end almost before reaching the realm of scientific therapeutics, and consequently, for purposes of practical utility, the book is too vague.

While we think that on certain points Professor Hewlett might have spoken more dogmatically and distinctly, or at least have expressed more definite personal views, we fully realise that the subject itself is not one which permits as a whole of dogmatism at the present day.

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*The Care of Infants and Young Children in Health*, by Mildred M. Burgess, M.D. (H. K. Lewis), is an excellent little manual in which the subject-matter has been carefully thought out and clearly expressed.

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In his preface to *Clinical Treatises on the Pathology and Therapy of Disorders of Metabolism and Nutrition*, by Professor Carl v. Noorden,



edited and translated under the supervision of A. C. Croftan, M.D., Chicago, U.S.A. (Rebman, Limited), Noorden says these lectures were delivered in a post-graduate course in May 1908. They are excellent lectures on a subject which the author has made peculiarly his own.

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Mr. Gustavus Hartridge's *Golden Rules of Ophthalmic Practice*, fifth edition (John Wright & Sons), is one of Wright's well-known series of *Golden Rules*, and is written, as each one of them is, by a master of the subject. Our view, however, is that such concentrated books are quite unworthy of their authors. This one, for example, is intended (to judge from phrases in the preface) for students, but it is a book from which no student could obtain much good, and which no student should be encouraged to possess, while it can at the same time be of little use to those who really know anything of the subject. We mean that while it is as well done as such an attempt at a *multum in parvo* can be done (the author's name makes that certain), it were much better left undone altogether. There is no room for comment anywhere. The text necessarily consists of the baldest statements, some of which are not always such as can be accepted without hesitation by the initiated: for example, page 21, "Purulent conjunctivitis is always due to specific infection by the gonococcus." This statement is not borne out by known facts. Again, on page 20, "Holmgren's wools are the best test for colour defects. The patient is not asked to name colours, but is given certain test colours to match." The passage quoted contains three statements, of which the first is open to doubt, but let it pass; as regards the third, if the patient is asked to do this it is only by a person who does not know how to employ the test, for it is impossible for the patient to do what he is asked to do; and with reference to the second, if there is one thing that should invariably be done *at the proper time* it is to make the patient name the colour.

Space must be economised, no doubt, but is it right under the heads of optic neuritis and atrophy, of retinitis and choroiditis, to give not one word of description of the appearances?

In a good many places the arrangement of the sentences is most clumsy, changing from a statement of fact to a command without a break; and in too many, it must be said, the grammar is faulty.

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*Thérapeutique usuelle du praticien*, by Albert Robin, Professor of Clinical Therapeutics in the Faculty of Medicine of Paris, pp. 520, Paris (Vigot Frères), deals with such common conditions as dyspepsia, arteriosclerosis, Bright's disease, &c. It is in no way a text-book but a series of clinical lectures on therapeutics, illustrated with cases. It is full of practical suggestions and gives the author's own experiences and methods of treatment. Contrary to the general tendency at the present day to give one drug at a time, the author makes frequent use

of somewhat complicated prescriptions, but always gives his reasons for the inclusion of the different ingredients. A perusal of this volume will amply repay the practising physician.

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We suppose that from time immemorial the puzzling question, "Where do the babies come from?" has been asked by boys and girls, and has been answered (if answered at all) by an ingenious subterfuge or a skilful evasion. In order that a more definite reply may be forthcoming, but one which shall not bring the blush of modesty to the cheek of innocence, Mrs. A. C. Caton has translated Hugo Salus's booklet ("Wo Kommen die Kinder her?") into English under the title, *Children: a Märchen*. The amount of information given regarding the antenatal state is small but sufficient, and we hardly think anyone will object to just so much being told to children; but "the breathing of a little angel on the window-pane" as an explanation of the beginning of the growth of the unborn babe is likely to throw the ideas of the inquiring boy and girl back again to the cabbage-patch of our youthful days.

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*Urine Examination made Easy*, by T. Carruthers (J. & A. Churchill), is written as a practical manual for nurses. It describes the ordinary normal and morbid appearances and physical characters of the urine in very simple language, and gives the common tests, e.g., for albumin, phosphates, blood, pus, sugar, etc., in a concise and eminently practical manner. It is well adapted for the purposes of nurses, and might be usefully read over as a memoriser by students before an examination.

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It is surprising how much useful information has been compressed into such small compass in Mr. Charles R. Whittaker's *Manual of Surgical Anatomy*, (E. & S. Livingstone). The contents have been carefully arranged, but surface anatomy is not described. The author wisely recommends that it should be read in conjunction with practical work in the dissecting-rooms and with reference to larger text-books of anatomy. If these conditions are fulfilled the student should find this book useful in summarising his facts and in a rapid revision of the subject. There are forty-five illustrations, many of them diagrammatic, but sufficiently obvious to illustrate the text.

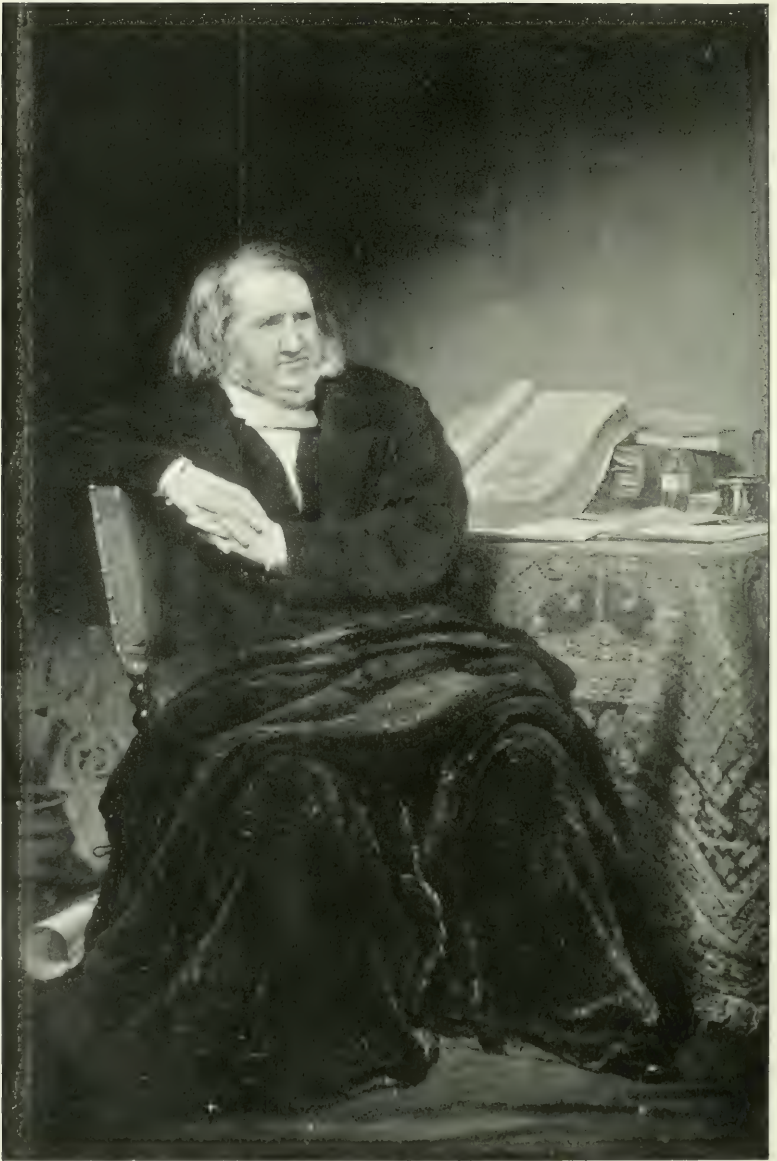
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*Correction*.—We regret that through a typographical error the name of the translator of Professor Kirmisson's *Handbook of the Surgery of Children* (Henry Frowde and Hodder & Stoughton) was incorrectly quoted in the review published in our last issue. The work was translated by Mr. J. Keogh Murphy, F.R.C.S.

In the review of Dr. Williams' *Index to the British Journal of Dermatology* the publisher's name, H. K. Lewis, London, was inadvertently omitted.—EDITORS.



PLATE I.



SIR JAMES Y. SIMPSON.

(From a portrait by Norman Macbeth, R.S.A., in the possession of Sir Alexander Simpson.)



THIS NUMBER OF THE  
EDINBURGH  
MEDICAL JOURNAL

IS DEDICATED TO THE MEMORY OF

James Young Simpson

*Born at Bathgate, Linlithgowshire, 7th June 1811*

*Died at Edinburgh, 6th May 1870*

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“TO WHOSE GENIUS AND BENEVOLENCE THE WORLD OWES THE BLESSINGS DERIVED  
FROM THE USE OF CHLOROFORM FOR THE RELIEF OF SUFFERING.”

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The Editors desire to acknowledge their indebtedness to Miss EVE BLANTYRE SIMPSON, to Dr. JOSEPH ANDERSON, of the Society of Antiquaries of Scotland, and to the various Medical Contributors who have aided them in the preparation of this tribute to the memory of Sir JAMES Y. SIMPSON.

They have also to thank Miss SIMPSON for the use of a series of photographs by J. D. EDWARDS, Edinburgh; Dr. A. H. FREELAND BARBOUR for the frontispiece portrait; and the Royal College of Physicians, Edinburgh, for permission to reproduce the autograph letter from their collection.

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\* On his bust at Westminster.

## SIR JAMES Y. SIMPSON.

By EVE BLANTYRE SIMPSON.

HAVING been asked on the centenary of his birth to contribute recollections of my father, as I said in the preface of a biography I wrote of him in the Famous Scots Series, my chief difficulty is to give in the space allowed an adequate sketch of a truly great man, and also to avoid the unconscious hero-worship of filial affection for one who was not only the best of fathers but the best and most lovable of men. The latter statement has corroboration in a pamphlet of Dr. George Balfour's on my father, written in 1870—"If no physician was ever more widely known it is still more true that no man, since the world was, was ever more greatly loved, and we do not exaggerate when we say we never knew a more lovable man." It is forty-one years this May since he passed away to what he longed for during forty-four of the fifty-eight years of his pilgrimage here, and what in some verses he wrote he called "a rest that knows no ending." He who gave sleep to the pain-stricken, who made the lancet doubly useful by plunging patients into a little death in life so that the artist hand of the surgeon could carve as it listed, craved often for *time* to sleep. He had the gift of it, could go into the "land of Nod," he said, in a rattling carriage, or snatch forty winks at will, but so incessantly did he work, night as well as day, he was deprived of the ordinary hours of slumber.

Pictures of him are vividly engraven on the tablets of memory, but they are difficult to reproduce. He was made in a unique mould, both in body and mind. Along with his great brain, his attractive personality, was his heart-whole eagerness for human advancement, his genuine humble-mindedness, which went far to make him a power for good in this world; to keep him what Burns avers a king, despite showering titles, cannot make—an honest man. There is no doubt my father was undoubtedly that *rara avis*, a genius. "I do not know," says the Duke of Argyll of Sir James, "that I ever met any man in whom genius was written more in face and voice and manner;" and Dr. Morell Mackenzie, lecturing in Edinburgh on culture, spoke of distinguished Scots past and present, but he said: "He omitted to mention the name of Simpson because he placed him far above cultured men. *He was a genius*, and though they might all have

some culture they could not all be geniuses." A genius at home is too often noted as being "gie ill to live with," but my father was an exception to this rule, with his frugally simple tastes and even temper. One failing he had, he was hospitable with an almost childish simplicity. A ball was to be given for his eldest son's home-coming as his assistant. The professor was chid for asking everyone he met. A discussion arose at dinner as to whether there were sufficient men. On the day of the ball he hurried in beaming from his lecture. "I asked all my class to come to-night. They seemed so pleased. There will be partners enough now."

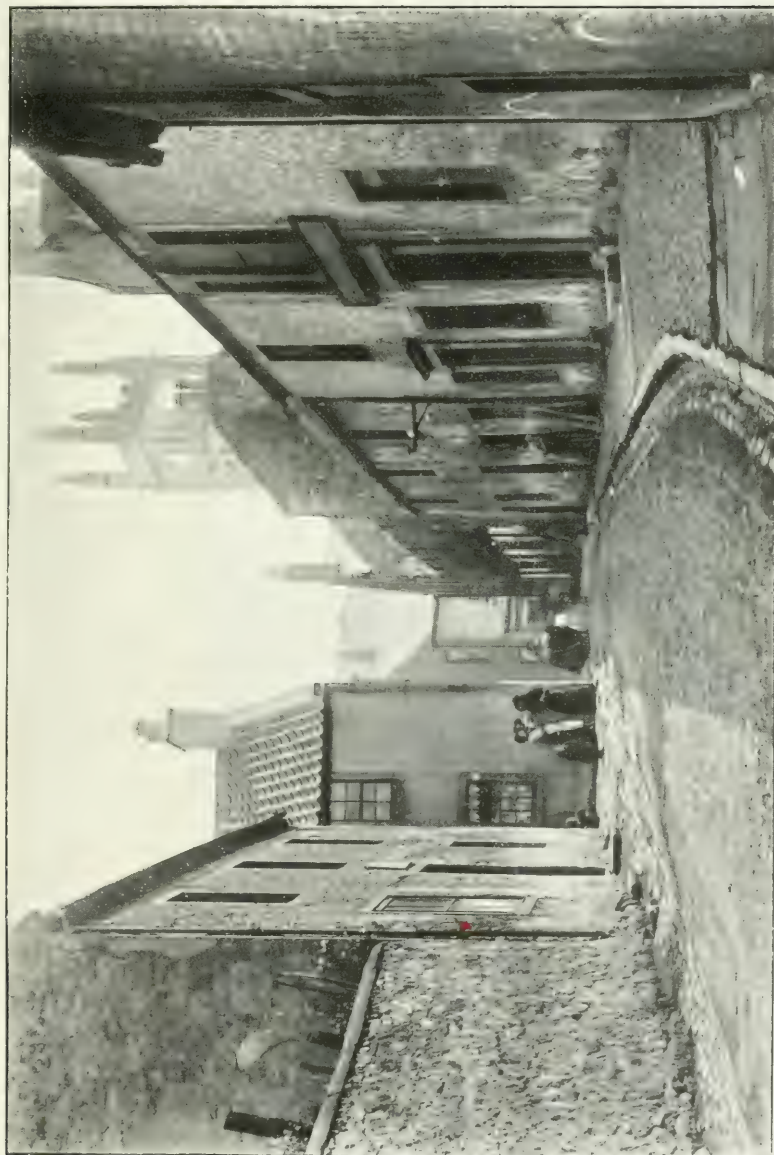
From his children's point of view the trouble of having a genius for a father, and one with such a magnetic nature as his, was that we had him very seldom to ourselves. His doors veritably stood open, his board was always spread. Red-letter days, alack! too few in his calendar for himself as well as for us, were those in which we were suddenly bidden to come on what he called a "scamper" with him, *i.e.* a hastily arranged, hastily taken excursion, likely a patient at the end of it, with maybe some hoary circle or cup-marked stones to be seen on the way. Sundays we saw more of him. The meals at 52 Queen Street on that day were taken usually with only the residents of the house, no lunch at which any amount invited or uninvited might appear. He always had four o'clock tea long before it was the custom, and we used to see him then for a few minutes; on Sundays he had tea-dinner at six, a meal which, unmanlike, he dearly loved. When opportunity offered he took a keen interest in all that we were concerned in, encouraging us in initial trips into the realms of fiction and poetry. Once when I was a very small child he met me on the stair, and took me in a pinafore, hatless of course, off to a house and showed me a book closely written. "Remember that is one of Scott's novels and you will soon be big enough to read it yourself," he said. It was *The Pirate*. If he saw us hesitating over a date, or a fact, or a quotation for a lesson, he would come laden with books and pour an overwhelming avalanche of them down beside us, and show various interpretations of the subject, thinking we had his unquenchable thirst for knowledge. Perhaps for a week after he might be away, or extra busy, but he would pop his head round the screen and ask if the quotation had been apt, and nod his satisfaction if it had. When we were at school he often took our dogs out on his rounds with him. He told us our favourite black-and-tan terrier, Puck, was

a capital assistant when he had children to visit. His photographs caught his outward semblance, sometimes gay, oftener thoughtful. His keen, deep-set eyes which saw so much could melt into a smile as well as the mobile lips. His countenance often was illumined by the light of which Fanny Kemble speaks—"I have seen looks that were Christ's, who has not, momentarily on mortal faces."

The house at Bathgate in which James Simpson was born on 7th June, a century ago, is now a mission hall, bought and given to his native town by a grateful patient in his memory. Main Street, where it stands (and the house opposite is the one he was brought up in, for his father, the baker's fortunes improving, they moved across the way), had in olden days been on the highway, where the coaches passed going from Glasgow to Edinburgh. Whenever my father saw a chance of a half-day free he headed for Bathgate, sometimes driving (how he would have revelled in a motor for speedy progress!), sometimes by train, and often posting over to Linlithgow to get an express home. The Bathgate of his youth was a very different place from the mining township he showed to us. It was then a countrified village, remnants of which remain in Main Street. One thoroughfare is called after a grand-uncle of his, Jervay Street. The Jervays were of Huguenot origin, and perhaps to this distant strain of French blood my father owed his readiness of thought and action, his vivacity and gladness, for he could "rainbow the tears of the world." "What," asks Lord Rosebery, speaking of the wayward but divine fire which we call genius, "what is genius? None can tell. But may it not be result in character of the conflict of violent strains of heredity which clash like flint and steel and produce the divine spark?" My father's maternal ancestors, though originally from France, for a hundred years were tenants of Balbardie Mains, and they, as well as his<sup>1</sup> Simpson forebears, had with thrifty perseverance tilled the soil in Linlithgowshire before its fields became rich and ugly in shale and oil. It is difficult to see how the "divine spark" was lit among the steady-going yeoman stock from whence he sprang. His grandfather was farrier as well as farmer, and we were shown the red-tiled byres of Slackend and a green field near, where this Alexander Simpson, unable to stay a plague among his cattle, sacrificed a cow, burying it alive to appease the spirit of murrain. My grandfather saw the earth heave after the wretched beast had been entombed. My father lent a willing ear to tales



PLATE II.





of all these old customs and superstitions. It was the irony of fate that his mother should have been a victim to a gross credulity when he, her son, did so much to relieve the sufferings of women. She had swallowed a packet of needles while dress-making. Her neighbours insisted on her gulping down a piece of raw meat to which a string was attached, and pulling it up again under the belief the needles would be found therein. My father was the proverbial lucky seventh son, but the luck lay in his father having married one who saw well to the ways of her household. Their fortunes were at a low ebb the day James was born, but mended henceforth, as my grandmother took control of affairs on her recovery, and by thrift and industry when she died at forty-nine left her family well to do. Her husband and sons promised her her heart's desire, namely, that her Jamie would have a college career. He went to Edinburgh University at fourteen, having undergone ten years' schooling. My father often said he had exceptional advantages in his youth in a happy home, humble though his surroundings were. For nine years he had the best of preceptors and teachers, a good mother, and on her death her only daughter and namesake, Mary, ably took her place, and his elder brother Sandy was his guide and counsellor, and was spared to him to the end. Cheap literature was not in vogue in his early days, but the books on the cottage shelves were read and pondered over—"More is got from one book on which the thought settles for a definite end in knowledge than from libraries skimmed over by wandering eyes. A cottage flower gives honey to the bee, a king's garden none to the butterfly."

Discussing at his luncheon table the educational value of the Bible and Shakespeare, my father candidly said: "I'd have given them both for Oliver & Boyd's *Almanac*, for I always wanted to know facts." He had learned how to search for them as a child. Bathgate was then a village of weavers, not of miners. Among them were men fond of geology and botany, and the baker's happy-faced Benjamin was a favourite with them. He would stand eagerly listening as they discussed some find, and thus in callow days learned the lesson how patient research yielded secrets only to the persevering. He traced among the ancient beliefs the ancient cures, and from the lore of past times he noted there was even from Adam's day a drug which could cast the quaffers thereof into a deep sleep. From the year he entered college he never ceased to work—keen to acquire knowledge, to be abreast of truth, to reach forward to things that are to come. As a student barely

in his teens, he allowed himself only a few scrimp hours of slumber. The author of *Rab*, watching him leave his publishers wrapped in a sealskin surtout, said: "There is not one man, there are many men, under that coat." Even the *many* could not have borne the strain of constant overwork which finally undermined his strong-built frame, but his eager enthusiasm was such he was bound to die in harness. He found it a relaxation to have a hobby. He liked verse-making, but archaeology became his chief diversion. He was a man of encyclopedian knowledge, Professor Masson said, and he amassed this knowledge by never wasting a minute, reading as he drove, or waited at stations, and, moreover, remembering what he read.

Though constantly travelling by road and rail, my father escaped being in any serious accident. A floor of his railway carriage was knocked out by a loose axle, but he put his feet up and sat and read till next stop. He was driven in Edinburgh at great speed, and the police made way for his swift, often galloping, steeds. He had, all the years I knew him, a grim, bad-tempered, devoted coachman, who revelled in the vicious-tempered, fast-going horses Croall kept him supplied with. They bolted coming in from Liberton one morning, and went at a murderous pace. Two policemen at their heads and a dray across the thoroughfare finally stopped their mad career. My father thrust his Jove-like head through the window—"Do go on, *please*; I'll be late for my lecture," he besought his masterful driver, who turned to the crowd and said sadly, "It's awfu' driving a man who doesn't ken he has been run awa' wi', and me all but killed." My father had been sleeping from Liberton, rocked in the swaying carriage, till they were stopped south of Surgeons' Hall. Once, before he had this teetotal but irate Jehu, he started at night for Hopetoun. He awoke and saw lights and houses, and said to himself, "Queensferry." He saw by his watch in the lamplight he had been driving an hour. "If you please, sir," said the coachman, who was *not* sober, "I've been driving round and round as fast as they'll go and can't find a way out. The horses are fair beat." He was hugging the garden railing side of Ainslie Place.

Railway travelling was not the luxurious thing it is now. The arms of the first-class carriages were immovable. He sometimes had to lie down on the floor of the compartment to stretch himself out to sleep, so he often returned stiff and weary and chilled after a journey to take up another day's work. "You've left half your knitted vests behind you somewhere," his servant said reproach-



fully. "No, I haven't," he replied with a twinkle in his eye; "I was so cold in the train last night I opened my bag and put them *all* on, and I've been so busy ever since I arrived I've had no time to take them off, though I am melting." A night in a present-day Flying Scotchman "sleeper" he would have hailed with joy as a place for an uninterrupted rest. We used to amuse ourselves speculating who would get him when he had been absent for a day, there were so many, even on his doorstep, ready to pounce upon him. It was usually a poor person who captured him, for he guessed a Newhaven fisher or a working man would not have sat hours waiting unless it was a case of dire necessity they wished him to relieve.

We had a summer cottage at Trinity, in grassy, secluded grounds overlooking the Forth, for he could drive there for an hour or two of quiet. He said he always felt refreshed with tea, an egg, and a sunset at Viewbank. Many distinguished foreigners he brought down to have a brief but uninterrupted talk there, and take them through the neighbouring quaint fishing village. Sometimes so rapid were his decisions, he left consternation behind him at Queen Street when a dinner party for celebrated guests had been ordered, but judging the weather was settled, and desiring to see the sun sink into the quiet west, he would drive the assembled company off to Viewbank. Cook, food, waiters and appointments had to follow in a long procession of cabs. He would smooth ruffled domestics and hungry guests, who, looking on the Forth, enjoyed their host's flow of soul till the feast was spread anew. He never got flurried, but surmounted difficulties with quick resourcefulness. A bottle of chloroform was spilt, and all were in despair, for no more was obtainable. My father promptly cut out the saturated square of carpet, used it instead of the napkin, and went on with the operation.

He had a strong sense of humour. He found a hearty laugh as refreshing as a sleep. He liked to tease and surprise people. He would open the door and steal in to put a hand over a book on which he saw the reader intent, or stand at the door waiting for someone to look up, greet them with one of his merry smiles, and leave them with a conundrum to puzzle over. He was excluded from the preparation of tableaux to be produced in his own house. He bided his time. The curtain went up for the "Babes in the Wood." Instead of two of his small hostages to fortune, Lyon Playfair and he, in blouses and socks, sucking oranges and crying lustily, walked across the stage. They were loudly encored by a

large audience. "You see I can act," he said to my mother. He took a joke against himself with hearty good will. A horse's mane comb was sent anonymously, with advice to use it well himself and hand it on to Dr. Candlish. He tried it on his tousie head himself, but thinking Dr. Candlish might not like it, bequeathed it to our deer-hound after he had shown it to all comers. He came in to lunch one day asking who was good at problems, for his students had asked him earnestly to answer one. A sealskin greatcoat a patient gave him was the cause of speculation. If a lady's short coat made of a few skins cost £60, how many seals went to make up his? He had no corners someone said, as he was so well padded and round, and he found it convenient at times. He joined the Berwickshire Naturalists to climb Yeavinger Bell to see an ancient fort atop of the hill. He rode up, as this spur of Cheviot was too steep for his overstrained heart, and as he had not ridden since he was a boy delivering his father's bread, he frequently fell off, but being round he said it did not hurt, and laughing, remounted. His carriage was stopped returning to Edinburgh one morning by a man who begged him to come and see his wife. The short-cut down the den of the valley of the Water of Leith where the cottage lay was perilously steep. Time pressed, as he had engagements at College and Infirmary. He sent the carriage round by a bridge to meet him, and *rolled* down the bank, forded the river, and kept his appointments smiling, for he had saved a mother's life. Recollections of his own mother remained green in his memory. He wanted all those he was fond of to be like his mother and his sister Mary. His eldest child, Margaret, he says in a letter, is *really* like Mary. He wrote home to Bathgate that he had been first attracted to my mother by a resemblance he saw in her to his sister. One Sunday as we left Dr. Guthrie's church he waylaid several girls about my size and marshalled us up a long stair in the Netherbow, where in a top flat lay, nigh unto death, a woman from Bathgate who had been to school with my aunt and remembered his mother. We children were silently ranged in a row. "Which is my daughter, think you?" he asked. She at once pointed to me, which pleased him vastly. "I always thought she had a look of *my* Mary's," he said with a satisfied sigh. That opinion of this fellow villager of his was better than most fees to him he said on his way home.

He knew the old town of Edinburgh well, for he visited many sick there. It was said of him he had no acquaintances, for no one spoke with him, or came under his personal influence, who did not

become his friend. Once he took me an expedition late at night through the Grassmarket and its surroundings to see how the rest of the world lived. I felt proud of staying up long after I should have been in bed. Meeting Dog Toby of the Punch and Judy show in private life impressed me. In the same lodging my father sat watching a man who could put a rapier down his throat. We went up many dark stairs into queer corners of "mine own romantic town," the old history of which he knew and explained. Child as I was, accustomed to hearing grateful patients belaud him, it was brought home to me how heartily welcomed, how beloved, my father was by his fellow-citizens in these over-crowded wynds and closes. "The king in a pack of cards might be a portrait of him," said someone, for with his broad build and massive head he was not a man you could pass in a crowd unnoticed; and in the thronged thoroughfares of old Edinburgh all knew, all greeted him. Even in that queer disreputable crowd they smiled and brightened at sight of him, feeling his divine power of sympathy. "I need not tell you," said one of the detectives who was with us, "we are only greeted like this when we've the Professor with us." His presence could change like magic the expression of many, high or low. The dull came to life when he spoke in that peculiarly pleasant voice of his, evil expressions changed for the better. He would come into his own luncheon-room where many waited for him—they were cross and antagonistic. During the Civil War in America Northerners and Southerners met at his house, but before his carriage dashed up to the door and he swiftly entered they scowled one at another. When he stepped in among his guests he was like the leaven which leaveneth the whole. They sat down, North and South, side by side in peace. The pity of it is many who did not need advice, who were pure idlers, or looked upon his house as a fashionable resort, clogged his activities, and interminable bores beset him. He had not the heart to be rude or inhospitable to them, sorely though they tried him. During his last months of illness he was kept to his rooms and saw mostly only his own people, though many were carried up to his rooms for advice, and night and day he worked on at his reforms for hospitals, his hopes to stamp out infectious disease by isolation, as by ancient statutes leprosy had been eradicated.

An eagle with wings spread ready for flight, with the motto *Alis Nutrior*, was the badge that had been borne by Simpspons before his day. My father truly had gained his bread on the wing. When he received a baronetcy (the first offered to a

doctor north of Tweed) he chose for a crest the healing rod of Esculapius, and for his motto one he had earned risking his life to find, *Victo Dolori*. "Tell me," he asked humbly when finally laid aside, "Tell me, don't you think I have done a little work?" His good life, his victory over pain, answered the question.

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PLATE III.



*J. Y. Simpson*

MEMORIES OF SIR JAMES SIMPSON.

By SIR ALEXANDER R. SIMPSON.

*To the Editors of the Edinburgh Medical Journal.*

52 QUEEN ST., 12th May 1911.

SIRS,—You ask for some memories of my uncle for the June number of the *Journal* that will commemorate the hundredth anniversary of his birth. Take, first, this reminiscent speech of Mr. Inlach, President of the Royal College of Surgeons, at the Jubilee Dinner of the Edinburgh Obstetrical Society:—"There is no one within those four walls, or I may say outside of them either, who has a greater esteem for your Society than I have, and I will tell you the reason why. About the year 1831 there came to our house a young man who was then amanuensis to Dr. John Thomson, the Professor of Pathology in the University of Edinburgh. I do not distinctly recollect his personal appearance at that time, because when you set your eyes on him your attention was at once completely absorbed with the general radiance of his whole expression, and when he tossed back his long black hair with his hand you saw a strong perpendicular cliff of a forehead, and beneath it benevolent, bright, clear eyes, indicating the man of genius and kind sympathy. This young man was James Simpson. Young though I was then, I was irresistibly attracted to him, and the acquaintance thus begun lasted uninterruptedly through a long lifetime.

"I had the great pleasure of seeing this dear friend advance step by step in his career. I saw nearly every paper that he wrote for the medical journals at that early time, as he brought them to our house, not for the sake of any laudation he might get about them—I, for one, being quite incompetent for that—but just for the simple reason that he knew it would give us pleasure to see his work.

"Time went on: he advanced in his profession, and I attended his first course of extra-mural lectures. To show his genial youthful spirit, I well recollect one winter's day when, coming out of the class-room in Surgeons' Square and finding some of us snowballing each other, he joined heart and soul in the play, taking as well as giving with the utmost of his might. I had great pleasure also in being intimately connected with him during

the time of his canvass for the Chair of Midwifery and rendering what little assistance I could for that object, and when the prize was won I felt as if I too had gained something. Gentlemen, time still rolled on and I saw my dear friend rise in the professional and social scale to, I think, the highest position attainable in his profession, the esteem of his fellow-countrymen, and the recognition of his Sovereign.

"Well and in manifold ways did he repay the devotion I felt to his genius, for when it became my turn to start in life no one gave me more encouragement and help than he did, and what little position I may have attained in my branch of the profession I owe in a great measure to him. At last I saw him sicken and die, leaving a great blank, and for a time all looked dull and dreary, but, gentlemen, looking, as I now do, from the quiet of retirement from professional life, I can see amongst you others who are striving well and successfully to maintain the reputation which he achieved for our city and who may some day hold as high a position as he did, and the youngest amongst you who may be spared to stand in my place some thirty or forty years hence may be able to tell a story somewhat like mine. This, gentlemen, is why I will yield to none in esteem for everything connected with your Society and the practice of obstetric medicine."

Again, take this, written for me by Sir Henry Littlejohn, but not at the time made use of, as a supplement for a paper I was preparing for *The Student* four years ago:—

"In the course of a long life I have been privileged to meet many of those distinguished in literature, science, and in my own profession of medicine, but only once in my life have I felt that magnetic something which tells one that he is in the company of a great man. Contact with Sir James Simpson as a professor consultant, or friend invariably quickened one's thought, and even his casual remarks (like those of John Hunter) on any department of medical science opened up lines of investigation fresh and invigorating. I was often struck by his pregnant remarks on questions affecting public health: indeed on any topic he was *facile princeps*, and even in the company of artists and literary men of the highest reputation he held his own. Indeed in every stage of his career he was equal to the occasion, and no one could have guessed that he was not to the manner born. I was witness in Paris to the marked effect of his presence and talk on men like Dubois, Pajot, Jobert, and Depaul. It may be truly said of him, *Nihil tetigit quod non ornavit.*"



I supplement what Sir Henry says of the visit to Paris with what struck Dr. Campbell, who had then a large obstetric practice both among the French and the foreign population and who went with Simpson to a reception in Madame Victor Hugo's salon. "The excitement," Dr. Campbell said, "was something tremendous, and for a time you could hear the sound of ss ss ss running through the room as there passed from mouth to mouth the exclamation, '*C'est Simpson, C'est Simpson.*'"

"The man of genius," said Mr. Imlach. In his *Autobiography* the late Duke of Argyll says: "There have been only four men whom I have come across who have had the enormous brain-case which was conspicuous in Hugh Miller—one was Dr. Thomas Chalmers, another was Sir James Simpson, the third was Hugh Miller, and the fourth was Professor Whewell, Master of Trinity and author of the *History of the Inductive Sciences*. These were all men of more than what we call ability—they were all men of genius" (p. 357). In another place the duke says of Sir James: "I do not know that I have ever met any man in whom genius was written more visibly in face and voice and manner. His spirit seemed to be always quivering in the presence of nature, as if conscious of her immense suggestiveness, and trembling lest he should miss even the slightest of her hints." "I have known two men," said the late Professor Charteris, "whom I could call men of genius—Dr. Norman Macleod and Sir James Simpson." I heard Mr. Edwards, one of our young surgeons, discussing Sir James's amazing activity with an American doctor and asking for an explanation. "It's all," said Dr. Otis, "in that big thinking apparatus of his."

The great brain gave him command of a long and accurate memory. He would recognise at once and greet by name a patient whom he had not seen for years, and recall the nature of her malady. A letter came from Stockton-on-Tees about a child said to be born with a tail. "There's a paragraph I read twenty years ago in Pitcairn's *Criminal Trials* about people with tails," he said to me. "Fetch volume"—I forget whether II. or III. He did not know the exact page, but he remembered that it was near the end of the first third of the book on the left-hand side more than halfway down, and in a second or two his finger was on the passage.

And the brain was in such immediate sympathy with all his senses that I often thought there was as much mind in his forefinger as in my whole constitution. He was keenly sensitive to

sight, to sounds, to all sensations. The scratching, as of a pencil on a slate, that is to many an annoyance, was to him a positive distress. Dr. Skinner, who was for two years his assistant, had an unhappy habit of stirring and stirring away at the bottom of his breakfast cup long after all the sugar must have been melted. Sir James had to tell him how it worried him, but Skinner would sometimes forget, till I saw the distressed patient look on my uncle's face and gave Skinner a little kick below the table. And this reminds me that there was no rancour in his disposition, no bitterness in his rebukes. When he took leave of Skinner I heard him say on his doorstep, "I have sometimes spoken sharply to you, but you'll forgive me." Skinner stayed a minute or two after to say to me, "Was there ever such a man? He never gave me an unnecessary scold, and if he had, the way he said *that* just now would clean blot it out of my memory. I can never think of him but with affection and admiration." To the end he retained his loyal devotion to his old master, notwithstanding that he took to practising homeopathy, the errors and absurdities of which Simpson had exposed in his *Tenets and Tendencies of Homeopathy*.

There was a sunny something about him that made one glad just to see him and that disarmed the criticism with which one might be prepared to meet him. Often and often has a patient, fretting under the delay of a long-expected visit, been ready with words of rebuke and complaint which gave place to a glad welcome when she saw the kindly gleam of the wonderful eyes and succumbed to the witchery of the winning voice. "Do you know your uncle is just fascinating," said a lady to me once, who through some misunderstanding had for a time been estranged from him, but had chanced to meet him again. "I had forgotten how bewitching he could be."

His son, Sir Walter, wrote:—"Watch his carriage as it rattles along the street. He has stepped briskly out before it has had time to stop at the curb-stone. A dwarf in stature, he has the muscle of a giant, the head of Jove himself. In his declining years, it is true, his hand was pressed to his side, his step showed some signs of weariness, but to the last his smile was bright and cheery. As he crosses the pavement to visit a patient he speaks for a moment to a passer-by. The effect is electrical. A few hurried words are all that pass between them, yet the stranger's sullenness vanishes in an instant. The brief interview has converted him into a bright and happy man, such as it would be

a pleasure to know." He goes on to picture an "odd assortment of human beings" gathered in his father's dining-room impatiently waiting his arrival. "The atmosphere is chill like the grave: each guest, eyeing his neighbour suspiciously, shrinks into his own social shell . . . when all at once Simpson bustles in. In a few minutes, under the genial influence of his presence, all tongues are set a-wagging—and well may you ask whether the men who leave his house after luncheon are those who but an hour ago regarded each other with cold disdain, for now they are cordial, kindly, sympathetic: each has been induced to show whatever was attractive in his nature or to give the fruits of his experience."

The eyes that usually beamed with goodwill and often with merriment could, however, shoot fire sometimes. When I was his class-assistant a member of the class made some noise that disturbed the professor. I noticed that he was silent for a second or two and looked at the offender. That was all. In the afternoon one of my companions said to me, "I wish you would tell your uncle not to look like that again. He gave us all a terrible fright, and I thought poor Landes would fall off his seat." He disappointed the class once when it expected to see him look fierce. It has been told me that Syme, having made a bit of a scene in the clinical surgery class-room by denouncing acupressure and tearing up his colleague's pamphlet on the subject, the midwifery class-room was crowded the following day. When the professor came in he just looked round the company with a smile, saying, "Gentlemen, torn arteries don't bleed," and went on with his lecture. Perhaps I have already exhausted your space.

Yours very faithfully,

A. R. SIMPSON.

With the permission of Sir Alexander Simpson we reproduce some portions of an address delivered by him to the Glasgow Gynecological and Obstetrical Society on 19th January 1897, entitled "The Jubilee of Anæsthetic Midwifery," and published in the *Glasgow Medical Journal*.

#### THE FIRST ANÆSTHETIC LABOUR.

I proposed to your secretary to meet you to-day, because it was on a Tuesday, the 19th of January, fifty years ago, that J. Y. Simpson

first made a woman in labour breathe the vapour of sulphuric ether and delivered her in her sleep. The case and its results were stated publicly on the following day—first to his class in the University, and later in the evening to his brethren in the Obstetrical Society. In the February number of the *Edinburgh Monthly Journal for Medical Science* some details were published; and in “Notes on the Inhalation of Sulphuric Ether in the Practice of Midwifery,” which appeared in the March number of that *Journal*, it is more fully recorded thus:—

“The first case in which I employed the ether vapour occurred on the 19th of January. The pelvis of the mother was greatly contracted in its conjugate diameter from the projection forwards and downwards of the promontory of the sacrum; the lumbar portion of the spine was distorted, and she walked very lamely. The present was her second confinement. Her first labour had been long and difficult; she began to suffer on a Monday, and, after a protracted trial of the long forceps, was at last delivered by craniotomy late on the subsequent Thursday night. Even after the cranium had been fully broken down, a considerable time and much traction had been required to drag the diminished and mutilated head of the infant through the contracted brim of the pelvis, and she was long in recovering. Contrary to the urgent advice of her medical attendant, Mr. Figg, he was not made aware of her present or second pregnancy till she had arrived at nearly the end of the ninth month. It was thus too late to have recourse to the induction of premature labour, which had been strongly pressed upon her as the only means of saving her child, should she again fall in the family way. The pains of her second labour commenced in the forenoon of the 19th. I saw her with Mr. Figg at 5 o'clock in the afternoon, and again at 7 o'clock. The os uteri was pretty well dilated, the liquor amnii not evacuated, the presenting head very high, mobile, and difficult to touch; and a pulsating loop of the umbilical cord was felt floating below it in the unruptured bag of membranes.

“From 5 to 9 o'clock the pains seemed only to push the circle of the os uteri further downwards, without increasing its dilatation or making the head in any degree enter into the pelvic brim. Assisted by Dr. Ziegler, Dr. Keith, and Mr. Figg, I shortly after 9 o'clock made the patient inhale the ether vapour. As she afterwards informed us, she almost immediately came under the anodyne influence of the ether. But in consequence of doubts upon this point, its use was continued for nearly twenty minutes before I proceeded to turn the infant (as I had previously predetermined to do). A knee was easily seized, and the child's extremities and trunk readily drawn down; but extreme exertion was required in order to extract the head. At length it passed the contracted brim with the anterior part of its right parietal bone deeply indented by pressure against the projecting promontory of the sacrum, and the whole cranium flattened and com-



pressed laterally. The infant gasped several times, but full respiration could not be established. The transverse or biparietal measurement of its head, at the site of the indentation, was, in its compressed state, not more than  $2\frac{1}{2}$  inches. Hence we judged the conjugate diameter of the pelvic brim not to exceed this. The infant was large, and rather above the usual size. It weighed 8 lbs. On afterwards examining the head and removing the scalp, no fracture could be found at the seat of the indentation. The thin parietal bone had merely bent inwards.<sup>1</sup>

“On questioning the patient after her delivery, she declared that she was quite unconscious of pain during the whole period of the turning and extracting of the infant, or, indeed, from the first minute or two after she first commenced to breathe the ether. The inhalation was discontinued towards the latter part of the operation, and her first recollections on awaking were ‘hearing,’ but not ‘feeling,’ the head of the infant ‘jerk’ from her (to use her own expressions), and subsequently she became more roused by the noise caused by the preparation of a bath for the child. She quickly regained full consciousness, and talked with gratitude and wonderment of her delivery, and her insensibility to the pains of it. Next day I found her very well in all respects. I looked in upon her on the 24th (the fifth day after delivery), and was astonished to find her up and dressed, and she informed me that on the previous day she had walked out of her room to visit her mother. Mr. Figg informs me that her further convalescence has been uninterruptedly good and rapid.”

#### SIMPSON'S FOREBEARS.

The earliest notice of Simpson occurs curiously enough in the first of two volumes, which contain a record of all the cases of midwifery that occurred in the practice of Mr. Dawson, surgeon in the village of Bathgate in West Lothian, where Simpson was born in 1811. It reads —“275. June 7. Simpson, David, baker, Bathgate. Wife, Mary Jarvey, æt. 40. Lab. nat., easy, rapid. 8th child. Son. Natus 8 o'clock P.M. Uti veniebam natus. Paid 10/6.”

David Simpson came of a race which in earlier generations furnished moss-troopers for border raids, and in more recent times had earned their bread by the hard toil of farmers, quarrymen, and other like peaceful avocations. David's father was a farmer, shrewd and energetic, and renowned in the countryside for his skill in the management of cattle and their diseases. There was a strong streak of superstition in him that came out in various ways. Thus, when a beggar woman who was wont to be wheeled in a barrow from one part of the parish to another had had her rest and refreshment at Slackend,

<sup>1</sup> The skull and casts of the infant's head are preserved in the Obstetrical Museum in the University of Edinburgh, and were exhibited at the meeting.

he bade a servant lass wheel the old wife away. To his dismay the woman broke out, "I'll hae nae bit hizzy like that to hurl me. Gaur ane o' your five braw lads gang wi' me, or it'll be the waur for this hoose." He remembered that his daughter had sprained her ankle when the woman had been round that way before, and taking it into his head that she was a witch, he whipt a sharp piece of flint out of his pocket and drew a gash across her brow, saying, "Ah, I see what ye're noo, ye auld witch; but I've scored ye aboon the braith, and my hoose is safe."

If James Simpson inherited from his paternal forebears the tireless energy, the patient industry, the readiness for conflict, the resourcefulness in emergencies that were to be in him so signally displayed, his mother transmitted to him qualities that were not less needful for the great career before him. Along both lines happily he inherited a reverence for grace and truth, a certain fearless independence of judgment, and that "firm resolve" which Burns apostrophises as "Thou stalk o' carl-hemp in man." But it was from his mother especially that he drew his exquisite sensitiveness to pain and tender sympathy for sufferers, his rare intuition-like power of rapid perception, his deftness of touch, his silvery voice, and the magnetic attractiveness that worked like a spell on multitudes. For Mary Jervay was of Huguenot descent on her father's side, and among her maternal ancestors she counted kin with some of the gentlest of Scottish blood. In particular the family took delight in tracing back their pedigree to James Cleland of that ilk, who was cousin to Sir William Wallace, and one of his henchmen in the Scottish wars with "proud Edward's power," which, happier than his kinsman, he lived to see broken when he followed Bruce to Bannockburn. She was 40 years of age when she gave birth to her seventh son and youngest child, and she continued to suckle him till he was 3 years old; so that when people would be speaking of their earliest memories he sometimes astonished a fitting company by saying he remembered when he was weaned.

### HIS BOYHOOD.

In Scotland a seventh son is ever an object of peculiar interest, and the winsome boy who occupied this place in the baker's house seemed at once to bring good fortune with him. Things began to amend in business after he appeared, and the sister who played for many years a mother's part to him proudly foretold his future greatness. As a child he must have been of cherubic innocence. The brother immediately above him in the family would tell how James came to him one day with great glee to show him a halfpenny that his quick eye had discovered under a stone in the corner of Gideon Street. "My, I wouldna like to be you," said David, with a very grave face.

"(Glowd-ma-grannie'll hae put it there." (Glowd-ma-grannie was the nickname of the village character who was the terror of the small boys and the butt of the bigger lads of that generation in Bathgate.) "If *he* finds out wha took his bawbee, you'll catch it." The little innocent went and slipped back the coin under the stone, where, of course, David found it by and by. Probably the disappointment was sweetened by one or two of the sugar-balls in which the halfpenny would be invested. That he could acquit himself well in boyish accomplishments may be gathered from the circumstance that when he was careering on stilts once in the gloaming he sent old John Crawford home in a fright, declaring to his household that he had "seen Jamie Simpson's wraith fleeing yont Jervay Street."

The head that, when it came to full development, was to be described, with its long wavy locks, as "Jove-like," was already noted in the youth to be of extraordinary size. When on a visit to his oldest brother at Grangemouth, the village barber there cropped his hair so close that his brother went to remonstrate with the man, who pled that the "callant had sic a muckle heid, I was daein' my best to mak' it look respectable."

#### STUDENT AND GENERAL PRACTITIONER.

As in many a Scottish homestead where love reigns, some of the older members stinted themselves to secure the education of the bright young brother who was the sunshine of their home. He learnt so much in his native town as to be able to profit by two years' attendance at the arts classes in the University of Edinburgh, and acquired a taste for literature, and especially such a knowledge of Latin as made it a delight for him in after years to hunt through all kinds of antique volumes to find out what had been known in former times on the many matters that came to engage his interest. For whether the subjects he treated of were more general, or more strictly professional, even when he was obtaining some new outlook and moving on to fresh lines of discovery, he was always eager to trace out the way along which the human mind had travelled; and many of his essays thus form a storehouse of reference for the history of their themes.

When he had studied medicine for three years he was able to obtain the diploma of the Royal College of Surgeons at the age of 18, and was thus qualified to apply for a situation as surgeon to the village of Inverkip. He has said that if chosen he would probably have worked on there as a village doctor all his days. That is not at all likely, but we can well believe him when he says—"When not selected, I felt perhaps a deeper amount of chagrin and disappointment than I have ever experienced since that date."

He spent a season in working sometimes with his friend, Dr.

Girdwood, in Falkirk, and more frequently with the family doctor, Mr. Dawson, in Bathgate. The worthy doctor was glad to have his aid in looking after some of his patients and making up their prescriptions, and occasionally got opportunities for him to make the post-mortem examinations which his spirit of scientific investigation prompted him to seek. In one case the old doctor pointed out to him a fistulous opening which had resulted from a central rupture of the perineum during labour, and on the way home remarked that it would have made a fine preparation. "I thought so," said his young assistant, "and I've got it in my pocket." He had a woodcut made of it years afterwards to illustrate his lectures, and here is the preparation still. In making his visits in the country he took note of the antiquities and natural history of the district, and made a special note of a bed of *Senecio saracenicus* growing at Kirkroads, near the site of an old Cistercian monastery—a plant which is said to have only one other habitat in Scotland.

Perhaps his experiences revealed to him that the department of the healing art in which he was most defective was what to a general practitioner is the all-important department of midwifery. He had a keen scientific bent, greatly fostered by association with his fellow-townsmen and room-mate in their college days, Dr. John Reid, who afterwards became Professor of Physiology in St. Andrews; and, as the midwifery lectures were not delivered till between three and four in the afternoon, he told me that, when he attended Professor Hamilton in 1829-30, he regularly went off to sleep. Hence, when he returned to Edinburgh to fit himself for taking the University degree of M.D., he attended three of the courses of lectures given by Dr. Thatcher, one of the extra-mural lecturers who was afterwards a rival in his contest for the chair. With this exception, he had given no special attention to the sphere of medicine with which his name was to be for ever associated, and at the time he attended Thatcher's lectures he was acting as first assistant to Dr. John Gairdner, who said of him that "his abilities and attention promise the most flattering expectations."

### HIS FIRST SITUATION.

The subject of the thesis which he had to submit for the obtaining of the doctorate, in 1832, was a pathological one—*De causâ mortis in quibusdam inflammationibus proximâ*—written, according to the custom of the time, in Latin. This thesis fell into the hands of Dr. John Thomson, who had been appointed to the chair of Pathology, founded at his own instance just a year previously. Professor Thomson, father of William and Allen Thomson, who filled with such distinction the chairs respectively of Practice of Physic and Anatomy in the University of Glasgow, was so struck with the ability of the young graduate that



he offered him the position of assistant at a salary of £50 a year. It was his first offer of a definite position and was gladly embraced. He had not only to assist the professor in the arranging of his museum and writing descriptions of his preparations and drawings, but also in the composition of his lectures. On one occasion he had written, at the request of his "chief," part of a lecture dealing with microscopic observations which were then quite novel. His young enthusiasm led him to write strongly of the importance of these researches, and of the light which the use of the microscope was likely to throw on various pathological problems. It was only ready in time for the professor to take into the class-room without previous perusal. Several times as he read the lecture to the class he looked up from his paper to glower at his assistant; and when they got to the side-room he shook his fist in his face, saying, "I don't believe one — word of it." But though Thomson was sceptical as to the value of the instrument that was to revolutionise his science, he had the shrewdness to recognise the rare gifts of his young assistant, and when he was unable to conduct his course in the session 1837-38, he got Simpson appointed as interim lecturer.

#### BECOMES OBSTETRICIAN.

He it was who first pointed out that in the sphere of midwifery Simpson would find the most fitting field for the exercise of his faculties; and, through the kindness of Dr. Moir, I can show you the note with which he furnished the student graduate when he advised him to get the profit of another course of the lectures of his colleague, Professor Hamilton. It reads:—

"MY DEAR SIR,—I beg leave to introduce to you the bearer of this note, Dr. James Simpson, an old pupil of your own, who has acted as my amanuensis for a long time. He is desirous to attend your lectures this winter, and I shall feel particularly obliged to you if you will have the goodness to give him a ticket for that purpose, and shall be happy in an opportunity at any time of obliging you in a similar manner.—Yours faithfully,

"JOHN THOMSON.

"80 GEORGE STREET,  
19th November 1833."

It was thus not till he had been for more than a year a graduate that he set himself earnestly to master midwifery, and busy though he necessarily was with pathology, by the time he had to read a dissertation to the Royal Medical Society in November 1835, he produced a work on *Diseases of the Placenta*, which is still a classic. In 1838 he began an independent course of lectures on his chosen theme, and felt so confident of success that as the professors entered on one occasion

for the "capping," which he had taken some lady friends to see in the University, he pointed to Professor Hamilton and said, "Do you see that old gentleman?—well, that's my gown." On the 4th of February 1840 the sagacious Town Council gave him the right to wear it, and commissioned him to teach midwifery and the diseases of women and children. When my father told Dr. Dawson of the happy event, the old man only said, "It's all very well to have got his chair. But you know he can never have such a practice as Professor Hamilton. Why, ladies have even been known to come from England to consult him." Happily he lived long enough to see ladies begin to come from the ends of the earth to consult Hamilton's successor.

#### PROFESSOR OF MIDWIFERY.

When Simpson took up the duties of that chair, it soon became manifest that a master mind had begun to deal with midwifery and the diseases of women. If it has been truly said that "he gave a new life to Obstetric art and science," it may be said that as for Gynecology he presided at its birth. It was born *eo obstetrice*. His genius showed itself (1) in his power of seeing things; (2) in his power of adapting means to ends; and (3) in his power of making others see what he had seen, and do what he had done. Let me illustrate this, first from the obstetric, and then from the gynecological department of his work.

Here is the cast of the head of a child which he helped Dr. Burns to deliver by means of Murphy's craniotomy forceps. After breaking up the skull he left the patient, according to the then common practice, to allow the uterus to recover its tone, and to give time for the commencing swelling of the passages to subside. Returning in a few hours, he found to his surprise that the head had already descended through the narrow brim, and the child was easily extracted. Surely such an occurrence was not novel. But Simpson saw it. He saw that unintentionally he had fractured the occiput close to the foramen magnum. He reasoned that if we could in every case fracture the base of the skull, the extraction of the head would be facilitated, and he set himself to contrive the cranioclast. As soon as he had proved its efficacy he published an account of it, and, as modified by Braun of Vienna, it speedily superseded all previous methods of reduction of the head.

In this jar you see a preparation of a uterus containing a fibrous polypus, the neck of which is in process of separation, resulting in a fatal hæmorrhage. Aided by the sound, which he had not long previously invented, he and his friend Dr. Alexander Wood, who had called him in to see the patient, formed a shrewd guess as to the cause of the patient's floodings: but they were not allowed to use any means to get at the seat of mischief. It would, I presume, be now impossible to

obtain such a preparation, for Simpson saw how that life might have been rescued if only they had had the power of opening up the cervix, and he contrived the now familiar sponge-tent for the purpose. Of course, other methods of dilating the canal have also been employed since then, but until Simpson saw that uterus, and showed how simply such patients could be cured, the writers on female diseases spoke of the *diagnosis* even of intra-uterine polypus as always doubtful, and in most instances impossible. Nothing more easy now both to recognise and to remove. He never kept anything secret that he thought could help his fellows, and it is hard to say whether his delight was greater in finding some new means to cure disease, or in demonstrating to others his methods of treatment.

The note-books of his student days are studded with points of interrogation attached to the dicta of his teachers. After he began to have Nature for his teacher, he questioned her at every turn, and ever and anon she yielded up to him some secret.

#### HIS VERSATILITY.

Surely there never was another to whom so many practitioners came to get new lessons in the healing art. For more than a quarter of a century, hardly a day, and never a week passed without bringing doctors to the house, to whom he had something fresh to show. The country doctor who came with a patient was shown others with kindred ailments, saw how they were being treated, and went back to his solitary sphere with new confidence and success. The foreign professor, who had been doubtful as to some procedures, came and stayed for a week or two, till he was satisfied of their feasibility, and returned to put them in practice, and teach them to his students. Younger men would come from all quarters, both of the old world and the new, to spend sometimes weeks, and sometimes months together, studying his principles and observing his practice, and then go to propagate them everywhere.

I do not attempt to speak of the work he did outside his profession, in archaeology ; in literature ; in politics, local and imperial ; in university and medical reforms ; and in many varieties of philanthropic enterprise. The great brain was never at rest, and found its recreation only in change of interest. Within the range of his profession his interests were not confined to the special department of his chair. Foreigners working in the sphere of surgery sometimes spoke of him as a surgeon. His old master, Professor Thomson, had told the Town Council of his day that he was "fully qualified to conduct the business of the Pathology class ;" and when Alison died in 1854 there were many who wished he would take the chair of Practice of Physic. Ere the day of anaesthesia dawned he had begun to vivify Midwifery and to bring Gynecology into

being as a science. Had he never lulled for woman her travail pangs, his name would still have been written among the immortals in his art. "Gifted," said his colleague, Professor Miller, in 1848, "with talents that are given to few; armed with a zeal and enthusiasm which are absolutely indefatigable; restless and eager, yet withal careful and scrupulous in his research for truth; full of a pure and large-hearted benevolence—he has made many discoveries and improvements in his profession, which are of themselves well capable of transmitting his name safe and honoured to posterity. But all are eclipsed in this his latest and his best. We admire his talents; we praise his zeal; we rejoice in his success; and while we honour his genius, we love the man."

#### ONE OF HER MAJESTY'S PHYSICIANS.

Before the news came from America that surgical operations might be carried out painlessly on patients narcotised with ether, his high position in the profession had been acknowledged in the highest quarters. Just at that time one of Her Majesty's physicians for Scotland died, and the Duchess of Sutherland, Mistress of the Robes, requested of the Queen to appoint Dr. Simpson to the vacant office. While he was conducting his first anæsthetic labour, this letter from Her Grace was on its way to Edinburgh:—

STAFFORD HOUSE,  
January 18th.

"DEAR SIR,—It was a great pleasure to me to receive yesterday a letter from the Queen, telling me that she should have much pleasure in complying with the request 'which his high character and abilities make him very fit for.' The Queen adds that it will be officially communicated to you.—I remain, Dear Sir, yours very truly,

"HARRIET SUTHERLAND."

The contents of Her Grace's note he communicated to his brother on the Friday following, the 22nd, in a letter which was never meant to be read beyond the family circle, but from which I quote two characteristic sentences:—"Flattery *from the Queen* is perhaps *not* common flattery, but I am far less interested in it than in having delivered a woman this week *without* any pain while inhaling sulphuric ether. I can think of naught else."

#### PREPARED TO WELCOME DISCOVERY OF ANÆSTHESIA.

This utterance reveals to us a quality which made him welcome with a peculiar eagerness the new discovery, and expend all his energies for its development—that is his delight in the lessening of pain. The great strong brain was matched with a great tender heart. In his student days he was so distressed with the screams and groans of a



poor Highland woman on whom Liston was performing excision of the mamma, that he quitted the Infirmary in sadness, and betook himself to the Parliament House. He thought of seeking work in some writer's office. On further reflection he returned to the scenes of suffering, with the problem pressing on his heart and mind how the pains might be relieved. In lecturing to students or addressing graduates he never wearied in insisting that "the proud mission of the physician is distinctly twofold—viz. to alleviate human suffering as well as to preserve human life." Ten years before the anæsthetic virtue of ether vapour was made known, whilst he was first establishing himself in practice, he made experiments with hypnotism, which Abercrombie, Alison, and other leaders of the profession came to his hospital to see. So when the news reached Edinburgh in 1846 that Liston had performed some operations on patients narcotised with ether, Simpson immediately began to inquire whether in the inhalation of sulphuric ether there might not at length be found the means he had been dreaming of for years of soothing the most agonising pains to which humanity is subject, the pains he had so often to watch with pitying helplessness—the pains of woman in travail.

#### FIRST MIDWIFERY CASE SELECTED FOR SCIENTIFIC EXPERIMENT.

The idea of surgical anæsthesia was not new. It was easy to believe that a means had at last been found of producing it. But to put to sleep a woman in labour is another and a new idea. In realising it, problems have to be faced that do not meet the surgeon. Bigelow, of Boston, and Liston, of London, for example, had the fancy that the benefits of anæsthesia in surgery would be principally seen in the practice of swift operators who had remarkable powers of execution, and in whose hands the patient would be for the briefest possible space under the influence of the anæsthetic. If it was to be used in midwifery at all it would require prolonged administration. That and other problems had to be met, and ere Simpson entered on the field it is very worthy of note that, eager as he was to prove the virtue of the new anodyne, he was careful to select a case that was fitted to afford a solution of the most important of the problems. The case, as we have seen, was one of deformed pelvis, in regard to which he says, "I had predetermined to extract the child by turning, and to try the inhalation of ether vapour upon the mother, with a view to facilitate that operation. During a week or two previously, I had anxiously waited for the supervention of labour in this patient; for, by the result I expected that much would be decided in regard to ether-inhalation in parturition. Would it merely avert and abrogate the sufferings of the mother without interfering with the uterine contractions? or, would it arrest simultaneously both the contractions of the uterus and the

sufferings that arise from them? As far as the proposed mode of delivery by turning was concerned, it was a matter of no vital importance whether the etherisation stopped the uterine contractions or not. And on this circumstance depended the eligibility of the case for a first trial of ether-inhalation. The result was most satisfactory and most important; for it at once afforded me evidence of the one great fact upon which the whole practice of anaesthesia in midwifery is founded—it proved, namely, that though the *physical sufferings* of the parturient patient could be annulled by the employment of ether-inhalation, yet the *muscular contractions* of the uterus were not necessarily interfered with; or, in other words, that the labour might go on in its course although the sensations of pain usually attendant upon it were for the time being altogether abrogated.”

#### CONCLUSIONS FROM SERIES OF OBSERVATIONS.

Having satisfied himself from his careful observation of this case that ether could avert the pains without arresting the contractions of the uterus, he proceeded to make application of it in other patients, and at the next meeting of the Obstetrical Society, on 10th February, he was able to give the history of etherisation in some cases of natural labour, and in one forceps case. The inferences that appeared deducible from these observations he stated in the following terms:—

“1. That the inhalation of ether procured for the patient a more or less perfect immunity from the conscious pain and suffering attendant upon labour;

“2. That it did not, however, diminish the strength or regularity of the contractions of the uterus;

“3. That, on the other hand, it apparently (more especially when combined with ergot) sometimes increased them in severity and number;

“4. That the contraction of the uterus after delivery seemed perfect and healthy when it was administered;

“5. That the reflex assistant contractions of the abdominal muscles, &c., were apparently most easily called into action by artificial irritation and pressure on the vagina, &c., when the patient was in an etherised state;

“6. That its employment might not only save the mother from the mere pain in the last stage of labour, but might probably save her also, in some degree, from the occurrence and consequences of the nervous shock attendant upon delivery, and thereby reduce the danger and fatality of childbed; and

“7. Its exhibition did not seem to be injurious to the child.”

In the early experiments the patients were not kept anaesthetised for more than half an hour, but in the course of the three or four

following weeks, he ascertained that anæsthesia could be safely kept up during labour for one, two, three, and even six hours.

#### SPREAD OF THE PRACTICE.

Having at once, as we have seen, communicated the success of his first experiment to his professional brethren, his example was followed, first in France by Fournier Deschamps, on 27th January, and then by Baron Dubois, who, on 23rd February, reported to the French Academy of Medicine the results of his experience, with the five following conclusions:—

“1. The inhalation of ether can annul the pain of obstetrical operations.

“2. It can suspend the physiological pains of labour.

“3. It destroys neither the uterine contractions nor the contractions of the abdominal muscles.

“4. It diminishes the natural resistance of the perineum.

“5. It does not appear to act unfavourably on the health or life of the infant.”

In London, Dr. Murphy first, on 13th February, and Dr. Prothero Smith in March, took up the practice. In Germany the first case of anæsthetic midwifery occurred on the 24th of February, under the care of Professor Martin, of Jena. “In America,” says Simpson in his report on the early history and progress of anæsthetic midwifery, “the country to which we are indebted for the first knowledge of the anæsthetic effects of sulphuric ether in surgical operations, the same agent was not employed in midwifery till the reports of its use in obstetric practice in Europe had recrossed the Atlantic.” It was on the 7th of April that it was first employed in a case of labour by Dr. Keep, of Boston.

#### INTEREST OF THE COMMUNITY IN ANÆSTHESIA.

In surgical practice the superinduction of anæsthesia was already meeting with opposition, which became only the more pronounced when it began to be employed in the practice of midwifery. In Edinburgh, in the early days of anæsthesia, many of the citizens found their way to the operating theatre in the Royal Infirmary, “among them,” says Professor Miller, “the great, the good, the singularly humane Chalmers, and it was one of the early triumphs of anæsthesia here to see that man of large and tender heart witnessing a bloody and severe operation with composure and serenity, feeling little because the patient felt not at all.”

#### OPPOSITION TO ANÆSTHESIA.

But all are not gifted with the open mind and the large heart of a Chalmers. Objections began to be heard on every hand that the novel

practice was unnecessary, was dangerous, was impious, and that no good could come of it ; and the loudest and most persistent objectors were found strangely enough among members of the profession, which, through all the ages, had been trying to lessen the sufferings of mankind. On the man who first dared to apply it for the relief of the pains of labour, fell the task of enlightening ignorance, of disarming prejudice, of dispelling superstition, and of vindicating for surgeons and accoucheurs the right to give, and for sufferers to claim, the ease that anæsthesia was calculated to afford.

#### RELIGIOUS OBJECTIONS.

To some minds it seemed that the proposal to still the sufferings of a parturient woman was to run counter to a divine command. "It has been ordered," wrote a medical opponent of the practice, "that in sorrow shall she bring forth." Simpson wrote a pamphlet in "Answer to the Religious Objections advanced against the Employment of Anæsthetic Agents in Midwifery and Surgery." It is an excellent example of his polemic power, proving from Scripture that the primeval curse as it bore on woman and on the ground was not immutable. He quoted "the sound and excellent Matthew Henry, in his own quaint, pithy, and zealous style," showing "how admirably the satisfaction our Lord Jesus Christ made by His death and sufferings answered the sentence now passed upon our first patient. . . . 'Thus is the plaister as wide as the wound.'" He indicated from the study of the Hebrew roots that to lessen the attendant pain was not to lessen the labour effort that the words seemed to demand. And then he pointed out how the objections raised against the practice of anæsthesia were applicable to improvements in agricultural processes, and had been applied to many discoveries in science and art—even the healing art, as in the case of vaccination. A clergyman spoke of chloroform as "a decoy of Satan," and his friend, George Gilfillan, furnished him with evidence that when fanners first came into use, a clergyman debarred from the communion those members of his flock who used what was termed "the Devil's wind." He was amused to find soon afterwards one of his students, a son of De Quincey, in his graduation thesis rebuking the unmarried ladies who stood up for what they thought was the divine law, and who insisted on their parturient sisters suffering according to the letter, in this fashion:—"The unhappy and wicked woman who remains unmarried appears to break the command herself in four several ways, according to the following tabular statement:—

- "1. She has no conception.
- "2. She brings forth no children.
- "3. Her desire is not to her husband.
- "4. The husband does not rule over her."

It pleased him to find De Quincey himself, in a letter appended to



the thesis of his son, arguing that "if pain, when carried to the stage which we call agony or intense struggle among vital functions, brings with it some danger to life, then it will follow that knowingly to reject a means of mitigating or wholly cancelling the danger, now that such means has been discovered and tested, travels on the road towards suicide. It is even worse than an ordinary movement in that direction; because it makes God an accomplice, through the Scriptures, in this suicidal movement, nay, the primal instigator to it, by means of a supposed curse interdicting the use of any means whatever (though revealed by Himself) for annulling that curse."

#### MORAL OBJECTIONS.

Besides the religious objections, there were what he was wont to speak of in his lectures as the moral objections. These in their various expressions were all based on the idea that the practice was unnatural. This idea, pervading the general community, and likely to prevent sufferers from obtaining the benefit of the new discovery, was vigorously championed by the various medical authorities who took it upon them to write down anæsthesia. Professor Meigs thought it "unnecessary, as shown by the birth of past myriads." Dr. Merriman spoke of "the great superiority of allowing Nature to conduct the whole process of the birth." Dr. Ashwell decried it as an "unnecessary interference with the providentially arranged process of labour." Dr. Montgomery, the then chief of the great Dublin School of Midwifery, wrote during the session a letter to Edinburgh, in which he said, "I do not believe that anyone in Dublin has as yet used ether in midwifery; the feeling is very strong against its use in ordinary cases, and merely to avert the ordinary amount of pain which the Almighty has seen fit—and most wisely we cannot doubt—to allot to natural labour, and in this feeling I heartily and entirely concur." I have before me the sheet from his lecture-notes, on which Dr. Montgomery's letter had been copied by Dr. Matthews Duncan, who was then junior assistant to Professor Simpson. Above the words "ether," "midwifery," &c., the professor has marked alternative readings. He would take one of these, suggestive of a doctor making his daily round among his patients, and ask you to imagine Dr. Montgomery writing, "I do not believe that anyone in Dublin has as yet used a carriage in locomotion; the feeling is very strong against its use in ordinary progression, and merely to avert the ordinary amount of fatigue which the Almighty has seen fit—and most wisely we cannot doubt—to allot to natural walking, and in this feeling I heartily and entirely concur."

#### MEDICAL OBJECTIONS.

Then there were various objections of a more distinctly medical kind. It was alleged that the use of anæsthetics would increase

the mortality of surgical operations. Simpson wrote papers full of laboriously collected statistics, which proved that while before the introduction of anæsthesia, in every 100 cases of amputation of the thigh performed in our hospitals, from 40 to 50 of the patients died, the same amputation when performed upon anæsthetised patients did not prove fatal to more than 25 in the 100 cases; or, in other words, that out of every 100 such operations the previous induction of anæsthesia was the means of preserving 15 or 20 human lives.

When obstetricians alleged that no good was gained by the relief of suffering, and when Meigs, for example, went so far as to speak of pain as "a desirable, salutary, and conservative manifestation of life-force," Simpson turned to the reports of the Dublin Lying-in Hospital, and showed that out of all the women—7050 in number—who were delivered within two hours from the commencement of labour only 22 died, *or 1 in every 320*; whereas in 452 cases where the labour was prolonged above *twenty* hours, 42 of the mothers died, *or 1 in every 11*; "a difference," as he said, "enormous in amount and strongly calculated to force us all to think seriously and dispassionately of the effects of severe suffering upon the maternal constitution."

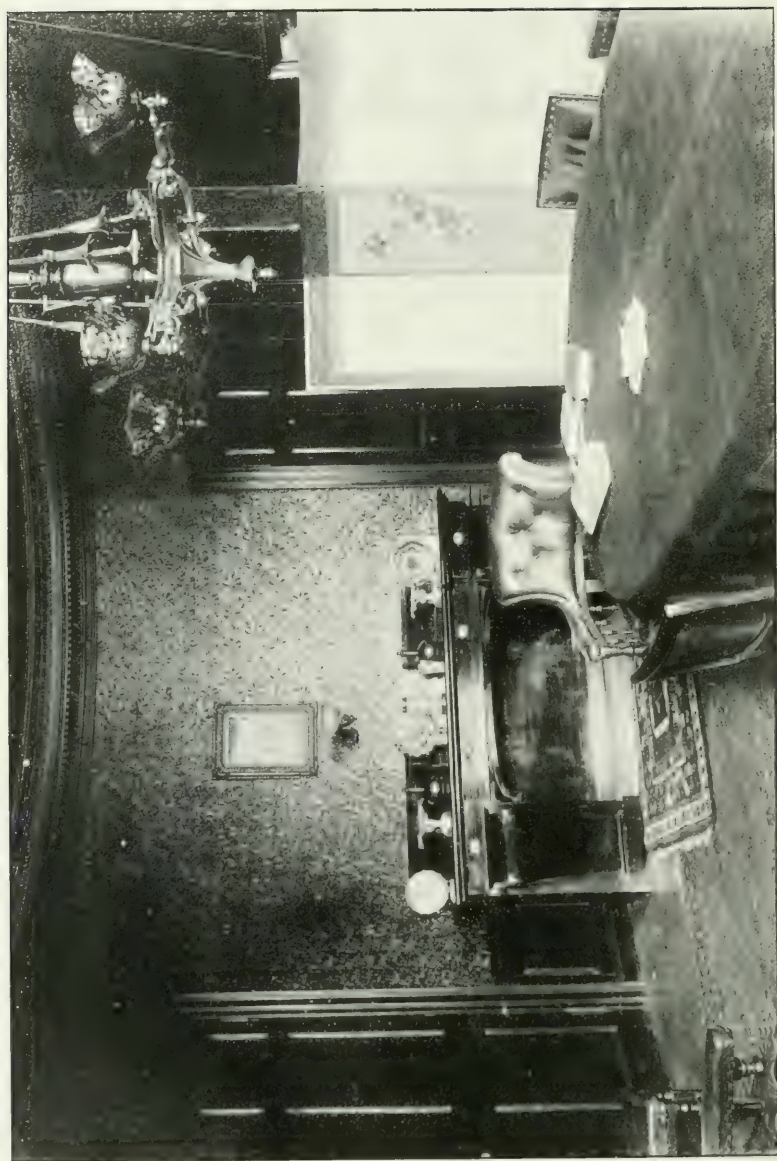
When it was alleged further that the use of anæsthetics might produce mental derangement, convulsions, paralysis, pericarditis, puerperal fever, and other mischiefs, he showed from the results of a constantly widening practice, the futility of such fears; and in regard to some of these complications of labour, and notably in regard to convulsions, experience eventually showed that so far from causing convulsions, the practitioner had been furnished in the administration of chloroform with his most reliable remedy.

The mention of chloroform reminds me that I have been anticipating.

#### IS SULPHURIC ETHER THE ONLY ANÆSTHETIC?

The mind that had riddled the student note-books with points of interrogation was bound to inquire whether Nature had not concealed among her treasures some other agent that might be possessed of the anæsthetic properties of sulphuric ether, without some of its attendant drawbacks. Ether, he noted, required to be administered in large quantities, especially in protracted cases of labour. It occasionally gave rise to bronchial irritations. Its odour was disagreeable and persistent, and hung for long about an accoucheur who had delivered a woman under its influence. He began to inquire whether other anodyne drugs could not be administered through the lungs, and got the chemists, Duncan, Floekhart & Co., to prepare ethereal tinctures and other vaporisable compounds of various potent sedatives for purposes of experiment. The researches he had made into the history of painless surgery quickened the expectation that other





DINING ROOM, No. 52 QUEEN STREET.

(In which Simpson, Matthews Duncan, and George Keith experimented with chloroform.)



gases or volatile liquids might yet prove serviceable. He talked the matter over with various professional friends more conversant with chemistry than himself, with teachers of chemistry, with practical chemists and druggists. He was led to make experiment on the inhalation of various liquids that seemed more fragrant and agreeable than ether, such as acetone, nitrate of oxide of ethyle, benzin, the vapour of iodoform, &c. Professor Gregory suggested chloride of hydrocarbon (Dutch liquid), which he tried on himself with dangerous consequences. Mr. Waldie, a Linlithgowshire friend who was in business as a chemist in Liverpool, suggested the terechloride of formyle. A small quantity of it was procured from Duncan, Flockhart & Co., but it seemed a heavy unvolatile-like liquid, and for the time was set aside. He had Dr. George Keith and Dr. Matthews Duncan as his assistants at the time, and he gladly expressed his indebtedness to them "for the great and hearty zeal with which they constantly aided him in conducting the inquiry." They used to put a teaspoonful of the liquid which they were testing in the bottom of a tumbler, cup, or saucer, or finger-glass. If it was not sufficiently volatile the vessel was placed in hot water. The mouth and nostrils were held over the mouth of the vessel and inhalation slowly proceeded with, and notes taken of the effects.

#### DISCOVERY OF ANÆSTHETIC VALUE OF CHLOROFORM.

Professor Miller, who lived next door in Queen Street, and looked in nearly every morning at "52" before starting on his rounds at 9 o'clock, has described the circumstances of the eventful evening when chloroform yielded up the secret of its subtle power in a graphic page, which furnishes a trustworthy record of the discovery. It reads:—

"Most of these experiments were performed after the long day's toil was over—at late night or early morn; and when the greater part of mankind were soundly anæsthetised in the arms of common sleep. Late one evening—it was the 4th of November 1847—on returning home after a weary day's labour, Dr. Simpson, with his two friends and assistants, Drs. Keith and J. M. Duncan, sat down to their somewhat hazardous work in Dr. Simpson's dining-room. Having inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material, which he had formerly set aside on a lumber-table, and which, on account of its great weight, he had hitherto regarded as of no likelihood whatever. That happened to be a small bottle of chloroform. It was searched for, and recovered from beneath a heap of waste paper. And, with each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party, they became bright-eyed, very

happy, and very loquacious—expatiating on the delicious aroma of the new fluid. The conversation was of unusual intelligence, and quite charmed the listeners—some ladies of the family and a naval officer, brother-in-law of Dr. Simpson. But suddenly there was a talk of sounds being heard like those of a cotton-mill, louder and louder; a moment more, then all was quiet, and then—a crash. On awakening, Dr. Simpson's first perception was mental—'This is far stronger and better than ether,' said he to himself. His second was, to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm. Hearing a noise, he turned round and saw Dr. Duncan beneath a chair—his jaw dropped, his eyes staring, his head bent half under him; quite unconscious, and snoring in a most determined and alarming manner. More noise still, and much motion. And then his eyes overtook Dr. Keith's feet and legs, making valorous efforts to overturn the supper-table, or more probably to annihilate everything that was on it; I say, more probably, for frequent repetitions of inhalation have confirmed, in the case of my esteemed friend, a character for maniacal and unrestrainable destructiveness, always under chloroform, in the transition stage. By and by, Dr. Simpson having regained his seat, Dr. Duncan having finished his uncomfortable and unrefreshing slumber, and Dr. Keith having come to an arrangement with the table and its contents, the *sederunt* was resumed. Each expressed himself delighted with this new agent; and its inhalation was repeated many times that night—one of the ladies gallantly taking her place and turn at the table—until the supply of chloroform was fairly exhausted."

Miss Agnes Petrie, the niece who shared in the experiment, amused them by folding her arms across her bosom before she fell quite asleep, and exclaiming "I'm an angel! oh, I'm an angel!" They sat up till 3 A.M., after the vial was empty, searching works on chemistry for its composition and best methods of preparation. Next day, Mr. Hunter, of Duncan, Flockhart & Co., began that distillation from a retort, which has grown in the hands of the firm to be one of the great industries of Edinburgh. When a few days later Professor Miller offered Simpson an opportunity of administering chloroform to an infirm patient on whom he was to operate for strangulated hernia. Simpson was unable to attend, and it happened, as has sometimes been seen in other surgical cases, that when the skin had been cut through, the patient fainted and died before the operation had been well begun. On the 10th of November Simpson formally communicated his discovery to the Medico-Chirurgical Society at its first meeting for that session, and when his communication was published, in pamphlet form, with a postscript on 15th November, he was able to announce that he had exhibited the chloroform to about fifty individuals "without the slightest bad result of any kind."



PLATE V.





## THE FIRST CHLOROFORM LABOUR.

As was to be expected, one of the first to experience the relief from suffering afforded by the new anæsthetic was a parturient patient ; and he gave at that meeting of the Medico-Chirurgical Society the following history of the case:—

“The lady to whom it was first exhibited during parturition had been previously delivered in the country by perforation of the head of the infant, after a labour of three days’ duration. In this, her second confinement, pains supervened a fortnight before the full time. Three hours and a half after they commenced, and ere the first stage of the labour was completed, I placed her under the influence of the chloroform, by moistening, with half a teaspoonful of the liquid, a pocket handkerchief, rolled up into a funnel shape, and with the broad or open end of the funnel placed over her mouth and nostrils. In consequence of the evaporation of the fluid, it was once more renewed in about ten or twelve minutes. The child was expelled in about twenty-five minutes after the inhalation was begun. The mother subsequently remained longer soporose than commonly happens after ether. The squalling of the child did not, as usual, rouse her ; and some minutes elapsed after the placenta was expelled, and after the child was removed by the nurse into another room, before the patient awoke. She then turned round and observed to me that she had ‘enjoyed a very comfortable sleep, and indeed required it, as she was so tired,<sup>1</sup> but would now be more able for the work before her.’ I evaded entering into conversation with her, believing that the most complete possible quietude forms one of the principal secrets for the successful employment of either ether or chloroform. In a little time she again remarked that she was afraid her ‘sleep had stopped the pains.’ Shortly afterwards, her infant was brought in by the nurse from the adjoining room, and it was a matter of no small difficulty to convince the astonished mother that the labour was entirely over, and that the child presented to her was really her ‘own living baby.’”

Seventeen years afterwards his friend, Dr. Adamson, of St. Andrews, sent Simpson this charming photograph that had just been taken by Rogers of a young lady. The accompanying letter told that it was a photograph of the baby of his first chloroform patient, and as you mark the mild angelic air that rests upon the upturned face above the folded hands, you will understand why Dr. Adamson suggested that it might stand for a picture of Anæsthesia, and that it was a pity the girl had not been called by that name.

Simpson believed that he had discovered in chloroform an anæsthetic

<sup>1</sup> “In consequence of extreme anxiety at the unfortunate result of her previous confinement she had slept little or none for one or two nights preceding the commencement of her present accouchement.”

that possessed various important advantages over ether, "particularly in obstetric practice; and that, in particular, it is far more portable, more manageable and powerful, more agreeable to inhale, is less exciting than ether, and gives us far greater control and command over the superinduction of the anæsthetic state." His interest in the new anodyne gave additional zest to the eagerness and energy with which he had set himself to demonstrate the right, and even the duty, of surgeons and accoucheurs to make use of anæsthetic agents; and he did not cease his efforts until he had seen the importance of anæsthesia fairly recognised, and such an impetus given to surgical progress as it had never before received, and such as has only been rivalled since when Lister—praised be the Queen who has raised him to the peerage—inaugurated the Antiseptic Era.

#### SIMPSON'S GREATEST DISCOVERY.

Any sketch of the man, whose services to anæsthesia we have considered, would be incomplete that took no notice of what was to him the most important incident in his life. One who asked of him in his last days, "What do you consider your greatest discovery?" got for reply—"That I am a sinner, and that Jesus Christ is my Saviour." That discovery came to him on Christmas Day, 1861. One of those great spiritual movements that powerfully influence a community was at that time spreading widely through the land, which had this among other characteristics, that it called out in a remarkable manner all classes of laymen, from nobles to navvies, to take part with the ordained ministers in what were then for the first time described as evangelistic meetings.

We have seen that Simpson's house was a rendezvous for all sorts and conditions of men. The strangest streams of life were constantly flowing through it. Candidates for seats in Parliament or in the Council Chamber of the city, for vacant chairs in the University, for posts in the Infirmary, for lectureships in many schools of medicine, and for pulpits in town or country—all came to seek his advice and bespeak his influence. Antiquaries came with their latest finds; artists and architects sought his opinion of their designs; poets brought him their new poems, and novelists their stories; the Arctic voyager, the African explorer, the traveller from Mecca, missionaries from all parts of heathendom, came with news and gifts of every kind. It could not be but that among the throng there should be some who told him that they had found what his friend, Dr. Hanna, called "the open secret." Salome's son, John, may have been ambitious and of a fiery temper, but he was not a bad man before the day when he heard the Baptist say, "Behold the Lamb of God," and he went and followed Jesus. Mary Jervay's son was not a bad man before that Christmas Day when in prayer with



PLATE VI.



GRAVE OF SIR J. Y. SIMPSON IN WARRISTON CEMETERY, EDINBURGH.



Mrs. Barbour he saw that the babe of Bethlehem had been born to give him second birth. But it was a new man who from that time began to fence his house with family worship: and when I look into the Bible which he bought to read the Scripture from, I find that where the prophet speaks of One "wounded for our transgressions," he has pencilled above the "our" the possessive singular "my." It was consonant with the great-hearted expansiveness of the man, that he began both in private and in public to share his joy with all who cared to taste of it. His conduct has been variously judged. The simple explanation is that the love of Christ constrained him, and when I last heard him address a meeting in the Free Barony of this city in the winter of 1867-68, there was the same note of personal experience and of wonder at "the infinitude of God's love to our fallen race" which marked his first appeals.

The change in his acknowledged relation to God in no way lessened the service he still delighted to render to his fellows, but it variously affected various minds. An Edinburgh gossip asked Miss Catherine Sinclair if she had heard of his conversion, and that excellent lady replied, "If Professor Simpson has been converted, it is time some of the rest of us were seeing if we do not need to be converted." When he presided at an evangelistic meeting addressed by Dr. Hanna, a woman said the sight of the chairman's happy face had done her as much good as a sermon. He went to a meeting of the Royal Society in the company of his life-long friend, Dr. Skae, of Morningside Asylum, and some of the Fellows thought it a good joke to infer that Simpson had gone mad, and to send round the rumour that Skae was looking after him. "And have you read it?" asked Dr. Andrew Wood of Father Rigg, afterwards Bishop of Dunkeld, when he told him that Professor Simpson had given him a copy of his address, entitled *Dead in Trespasses and Sins*. "Yes," said that good Catholic, "I have read every word of it." "Well, what do you think of it?" "It's the production, sir, of a genius."

When Sir David Brewster died in 1868, Sir James Simpson, who had been asked to move the resolution of regret in the Royal Society of Edinburgh, told how he had seen that "archpriest of science passing fearlessly through the valley of death, sustained and gladdened with the all-simple and all-sufficient faith of a very child." His words described to the letter his own departure in 1870; and if, with Sir David's gifted daughter, we try in imagination to follow these great spirits through tracts unknown, and to see on what high quests they fare forth there, we can only say with her of one as of the other—

"We see not, we see not: but this we know,  
He has bowed his head with its honours low,  
'Not mine! not mine!' is his whisper meet,  
As he casts his crown at his Saviour's feet."

## SIR JAMES YOUNG SIMPSON'S WORK IN ARCHÆOLOGY.

By JOSEPH ANDERSON, LL.D.,

Professor of Antiquities to the Royal Scottish Academy.

It was a striking illustration of Sir J. Y. Simpson's strong personality and many-sidedness that he was able to detach himself at will from the absorbing interests and responsibilities of his professional work in order to engage in the pursuit of some problem in archaeology with all the fervour and enthusiasm of his nature. This course he no doubt adopted from the necessity of obtaining some relaxation from the pressure of professional duties, but the direction of his choice was due to the natural bent of his mind. His interest in the study of antiquities had begun early, and was manifested at first in connection with subjects arising out of his professional studies. Fortunately he did not dissipate his energies on speculative discussions in the general field of archaeology. The tendency of his mind being eminently practical, he was thereby led to direct his attention more immediately to the two sections of the general field which lay nearest to his own personal sympathies—the medical aspect and the Scottish aspect of the study. The services he thus rendered to Scottish archaeology were many, and of supreme importance. His work was always thoroughly scientific in its methods, and distinguished by a determination to make his investigations as complete, exact, and accurate as possible. Hence he never touched a subject which he did not illumine on all sides by laborious research. He joined the Society of Antiquaries of Scotland in 1849, and speedily became one of its most active members, holding office on the council and subsequently as Vice-President. His communications to this and other societies were numerous, and each was a most comprehensive treatise on the subject in hand, in all its aspects and relations. At the first meeting of the Society after his lamented death in 1870, Dr. John Stuart, Secretary, summed up the characteristics of his archaeological work by saying that the many valuable papers which he had contributed would be an enduring monument of his wonderful archaeological attainments, "but those only who had had reason to know the pains which he bestowed on their preparation—his sifting of authorities, his resolution to exhaust every point which could illustrate his subject—could really understand their value."

PLATE VII.



BUST OF SIMPSON, BY PARK.

[Et. circa 40.]





One of his early efforts in the archaeology of a subject connected with medical studies was the "Essay on Leprosy and Leper Hospitals in Scotland and England," communicated to the Medico-Chirurgical Society in 1841 and afterwards printed, first in the *Edinburgh Medical and Surgical Journal*, and latterly in his collected *Essays* edited by Dr. John Stuart, 1872. It is marked by all the characteristics conspicuous in his later work, the thoroughness of his research for contemporary descriptions of the symptoms being curiously illustrated by his finding evidence in the poems of Henryson (c. 1500) which enabled him to diagnose the leprosy of Scotland as the disease known as Greek Elephantiasis. His predilection for the archaeological side of medical subjects was subsequently shown in a communication made in 1851 to the *Monthly Journal of Medical Science*, entitled "Notices of Ancient Roman Medicine Stamps Found in Great Britain," containing elaborate descriptions of all the known examples of these "proprietary medicine" stamps, the nature of the medical drugs they indicated, and the ophthalmic disorders for which alone these stamps were used. In 1852 he communicated to the Society of Antiquaries of Scotland a similar paper "On Some Ancient Greek Vases containing Lykion," and in 1856 he printed a pamphlet discussing the question—Was the Roman Army provided with Medical Officers? and reviewing the evidence, literary and monumental, for an affirmative answer, in his usual exhaustive manner. In 1862 he communicated to the Epidemiological Society of London a paper entitled "Antiquarian Notices of Syphilis in Scotland," a singular example of the fertility of a systematic search of contemporary literature and record for all that could be gathered together on a specific subject so obviously unpromising.

By this time his interest in archaeological subjects had broadened and deepened, and was no longer confined to the limited circle of professional subjects. In 1857 he read to the Society of Antiquaries of Scotland a paper "On an Old Stone-roofed Cell or Oratory in the Island of Inchcolm." This was a humble structure of unhewn stones built without mortar, and serving as a pig-sty when it first attracted his notice, but the features of its construction, recalling those of the early monastic cells he had seen in Ireland, led him to a more minute examination of it, and to the conviction that it was a construction of a similar early type. Turning, then, to an examination of the early history of the island he found reason to identify it with the cell of the

island hermit mentioned by Fordun as belonging to the service of St. Columba at a little chapel there, and whose hospitality King Alexander I. enjoyed for three days when driven on the island by a storm some time before the year 1123. It is characteristic of his methods that, in discussing the relations of this structure to the oratories of the early Celtic Church in Ireland, he diverged into a dissertation on early Scoto-Irish ecclesiastical architecture, of which the most notable remains in Scotland are the Round Towers of Brechin and Abernethy, and disinterred from the Paris edition of Boece's *Scotorum Historia* (1526) a reference to the Round Tower of Brechin which had hitherto escaped detection, probably because it has been omitted both by Bellenden and Hollinshed in their translations.

In 1860, as Vice-President of the Society, he delivered an inaugural address "On Archaeology, its Past and Present Work," so notable, not only for its masterly grasp and clear statement of the true aims and objects of the science, and the means and methods by which alone they can be attained, that after the lapse of half a century it may be read with interest and profit as practically applicable to the study of Scottish archaeology to-day. In it he pointed out that there were few studies which offer so many tempting fields of observation and comment as archaeology, because the leading object of all its pursuits is man and man's ways and works, from the earliest times at which his traces can be found upon the earth, and that along the whole of his journey of past time he had everywhere left scattered behind and around him innumerable relics forming so many permanent impressions and evidences of his march and progress, which it was the business of the archaeologist to collect, classify, and interpret. The study of these relics, for the reconstruction of the lost history of the past races and nations of men, should naturally possess an interest even more engrossing than that by which the geologist tries to regain the history of the past races and families of the fauna and flora of the ancient world. Formerly the pursuit of archaeology was not unfrequently regarded as little better than a kind of romantic dilettanteism, but the modern inductive archaeology had achieved some notable triumphs of discovery in recent times, and now had as little relation to the antiquarianism of former days as modern chemistry and astronomy have to their prototypes—alchemy and astrology. That Scotland had not lagged behind the other and greater kingdoms of Europe in the cultivation of archaeology

was attested by the rich and valuable Museum of Scottish Antiquities which the Society of Antiquaries of Scotland had gathered together, and had recently made over to the Government as national property. It now behoved every patriotic Scotsman to contribute, so far as it lay in his power, to the enrichment and extension of this great national collection. Single specimens in the hands of private individuals were generally naught but mere matters of idle curiosity, whereas all of them became of use, and sometimes of great moment, when placed in a public collection beside their fellows. "Like stray single words or letters that have dropped from out the Book of Time, they themselves individually reveal nothing, but when placed alongside of other words and letters from the same book, they gradually form, under the fingers of the archæologist, into lines, and sentences, and paragraphs, which reveal secret and stirring legends of the working of the human mind and human hand in ages of which, perchance, we have no other existing memorials." Giving a whimsical turn to his address by professing envy of the reputed power of the spiritualists, which they put to so little practical use, and supposing that he had the power of calling up the spirits of the bygone ages and thus securing the presence of "a very select and intelligent deputation of Ancient Britons and Caledonians," he would be inclined to cross-examine them upon the hitherto unsolved problems of Scottish archæology, of which he enumerated no less than sixty awaiting solution. But, while he had no faith in such a summary and supernatural solution of these problems, he did not doubt that many of them would be solved through time, by the ordinary and legitimate means of investigation and induction, carried out upon the principles and methods now recognised by all the sciences.

In 1861 he communicated to the Society of Antiquaries of Scotland a paper "On the Cat-Stane, Kirkliston," afterwards published separately, in which, with his usual wealth of illustrative research but less than his usual cogency of evidence and argument, he suggested that from its inscription it might be inferred to be the monument of the traditionary grandfather of Hengist and Horsa. This suggestion naturally provoked criticism, to which he rejoined that he did not regard the matter as finally settled, although some high authorities had declared in favour of it. In the same year he dealt with a congenial subject by reading a paper "On Some Scottish Magical Charm-Stones and Curing-Stones," in which he instanced many surviving superstitions connected with

the cure of diseases in men and cattle by charm-stones or amulets, of which he described and exhibited three of the most notable—the *Clach-na-Bratach* of the chiefs of Clan Donnachie, the *Clach Dearg* of the family of the Stewarts of Ardvairlich, and the Lee Penny of the Lockharts of Lee—illustrating the subject with his usual comprehensive range of references, from the curing-stone of St. Columba, which was preserved among the treasures of Bruide, King of the Picts, to the more modern examples of snake-stones and adder-beads. In 1864 he contributed a paper “On Ancient Sculpturings of Cups and Concentric Rings on Stones and Rocks in Various Parts in Scotland,” which was afterwards (1867) published in a separate and enlarged form, under the title of *Archaic Sculpturings of Cups and Circles upon Stones and Rocks in Scotland, England, and other Countries*. This volume is still unsurpassed as an authority on these cryptic sculpturings, and the treatment of the subject forms a model for similar investigations. Beginning with an exhaustive examination of the nature and characteristics of these sculpturings, he divided them into a series of typical varieties, and after enumerating the different classes of ancient monuments on which they occur, tracing them throughout the whole area of the British Isles, and following them in other countries so far as he could find them on record, he summed up the conclusions at which it was possible to arrive by strict induction, without being able to suggest the definite periods of their age or origin, or to explain their purpose or significance. It was surely better frankly to own ignorance than to wander off into vague mystification and conjecture. In following out his personal search for examples of these carvings he had been led by their occurrence in weems or underground houses to search for them in the caves of the seashore near Wemyss in Fife, and found that many such incised sculpturings existed on the walls of these caves, not only of the kind he was in search of, but representations of animals and conventional symbols identical with those occurring on the sculptured stones of Scotland. This discovery he communicated to the Royal Society of Edinburgh in 1866, and an extended notice of the sculptured caves, with copious illustrations, was included by Dr. John Stuart in the preface to the second volume of *The Sculptured Stones of Scotland*. In 1868 he communicated to the Royal Society of Edinburgh a paper entitled “Pyramidal Structures in Egypt and Elsewhere, and the Objects of their Erection,” a revised abstract of which, with additional notes and an appendix,



was afterwards included in the *Essays* edited by Dr. John Stuart under the title, "Is the Great Pyramid of Gizeh a Metrological Monument." Starting from the meaning of the word pyramid, and tracing the analogy between all known sepulchral cairns and the Pyramids, he showed that the type and purpose of them all was the same—that a gigantic sepulchral cairn was an unbuilt pyramid, and that a pyramid was a built sepulchral cairn. All authors, from the Father of History downwards, have agreed in regarding the Pyramids of Egypt as magnificent and royal sepulchres, and sarcophagi have been found in their chambers when first opened. By certain modern writers it has been maintained that the Great Pyramid at Gizeh is not a royal mausoleum but a marvellous metrological monument, constructed for the preservation for all time in its external measurements a standard measure of length, and in the granite coffer or sarcophagus in its interior a standard measure of capacity and weight for all nations. A measure of capacity should surely be itself measurable, but the remarkable thing about this granite coffer was that though it had been measured with the most careful efforts at exactitude by no fewer than twenty-six different observers, their measurements all differed from each other. From this, as well as from the fact that the basal measurements of the Pyramid itself all differed, the futility of the theory that the whole arrangements of the Pyramid had been made with reference to the preservation of standard measures was obvious.

Apart from his writings, however, the influence of his magnetic personality and contagious enthusiasm was perhaps more effective in diffusing a spirit of inquiry among his friends, his students, and even his patients. He interested them all by recommending them to visit the museum, and set many of them working for him by asking for their help in clearing up obscure points which he had met with in the course of his inquiries. This they were always glad and proud to do, some by ransacking the literature of various periods and languages, suited to their tastes or pursuits, and others by verifying and amplifying the descriptions of antiquities in localities to which they had convenient access. Not a few of those he thus inoculated with the love of observation and research did good archæological work on their own account in after years. He occasionally delivered popular lectures on archæological subjects in country towns to delighted audiences, usually choosing for his discourse the antiquities of the near neighbourhood, often familiarly known, but nowise under-

stood, until invested with the wide and wonderful interest which he knew so well how to create in the popular mind. "He was," said Dr. Stuart, "the centre and bond of union of a wide circle of inquirers both at home and abroad, and it was one of his greatest pleasures to bring together, amid the hospitalities of his own house, friends who were engaged in kindred pursuits, while his manifold connections gave him opportunities of obtaining information and kindling research which were never neglected. With all his wonderful powers and acquirements Sir James Simpson was one of the most modest and gentle of men, and it was not saying more than the truth that his removal had deprived us of one of the most valuable and pervading influences in the promotion of archæological and historical research."

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PLATE VIII.

to the Members of the Expedition Committee,  
Gentlemen,

- was prevented by a severe indisposition of  
many weeks duration from reading my dissertation last winter.  
It shall in consequence be placed, I believe, very early on the  
rack for the ensuing session. The subject, or rather subjects on  
which I was to write were the Structure, Functions & Diseases  
of the Intestine. After carefully considering these three topics  
it appeared to me that to discuss them all in a way in my  
own satisfaction would require limits greatly more exten-  
sive than those assigned to an ordinary dissertation. I would  
therefore humbly beg of you to allow me to restrict my dis-  
ertation to the Diseases of the Intestine, a subject on which I  
can most amply supply it for such an Epitome.

in - Entfernung

Your most obedt Servant

At the end of the line,

1830

Printed James Y. Simpson

AUTOGRAPH LETTER WRITTEN BY SIMPSON.  
(Now in the possession of the Royal College of Physicians, Edinburgh.)



SIR JAMES SIMPSON'S INFLUENCE ON THE  
PROGRESS OF OBSTETRICS.

By SIR HALLIDAY CROOM,  
Professor of Midwifery, University of Edinburgh.

To render an adequate record of Simpson's work in obstetrics is a difficult task, because his whole work in medicine, surgery, midwifery, and gynecology is so intertwined that it is not easy to give his purely obstetric work the position which it deserves.

There can be no question at all that his application of ether to obstetrics and his subsequent discovery of chloroform so far outshadow everything in his life, that there is danger of underestimating the value and importance of his obstetric work. To realise, therefore, how the immense impulse that he gave to the study of obstetric medicine became a source of inspiration to so many workers in the department, we have only to recall the relative position of obstetrics when Simpson began, and when he ended his career.

Simpson's introduction to obstetrics seems to have been to a great extent the result of his graduation thesis. This greatly attracted the attention of Dr. John Thomson, the Professor of Pathology, who, in consequence, offered him his assistantship. With him he worked, and occasionally lectured, for some considerable time. Thomson advised him to devote himself to obstetrics, realising that, so far as scientific research work was concerned, it was as yet a practically uncultivated field. Thus in the study of pathology he laid a solid foundation for his work in obstetrics. This was further strengthened by the fact that early in his student career he was a pupil of Goodsir, with whom he had the further advantage of a thorough anatomical training—anatomy and pathology then, as now, being the bed-rock upon which a sound knowledge of obstetrics stands.

His election to the Senior Presidency of the Royal Medical Society gave him the opportunity, at the age of twenty-four, of writing a remarkable paper entitled, "Pathological Observations on the Diseases of the Placenta," a communication which foreshadowed in no obscure manner many of the pathological changes which have been the field of much elaborate investigation and discussion since.

It is needless now to discuss his views upon placentitis, because

these views have been entirely modified and altered since his days. It must be always credited to Simpson that as early as 1836 he suggested that the "fatty" matter frequently found in the placenta might be in reality the result of changes in blood clots, and to him must be credited also the merit of making the first definite attempt to influence the health of the foetus through the maternal blood by the administration of alkaline salts, especially chlorate of potash.

Shortly after that he wrote a striking paper introducing the subject of intra-uterine pathology, the title being, "Peritonitis in the Foetus in Utero." This received but scant attention at the time when Simpson wrote it. The greater portion of it treats of foetal peritonitis in cases where post-mortem examinations had been made on still-born children, and in these cases Simpson rightly attributed the prominent place to syphilis. He first laid down the axiom that when a mother gives birth to several dead children in succession, syphilis may be assumed to be the cause.

In the following year he wrote an additional paper on the "Inflammatory Origin of Some Varieties of Hernia and Malformation of the Foetus."

He was thus a pioneer in the now extensive and abstruse subject of antenatal pathology, which the Edinburgh School of Medicine, through the unwearied labours of Ballantyne, has done everything to elucidate since.

His article on "Hermaphroditism," written about this time, and communicated to the *Encyclopædia of Medicine*, is, even to this day, a very full and scientific presentation of the subject.

Simpson had been an extra-mural lecturer for three years when Professor Hamilton died, and the Chair of Midwifery became vacant. The story of the contest for this Chair, with its fierce antagonisms, is a matter of history, and need not be again opened up here; it has been fully recorded in various excellent biographies. SuffICIENT to say that the Town Council of Edinburgh gained for itself endless fame in selecting Simpson for the Chair, and his appointment to it in 1840 was one of the glories of Edinburgh University.

He was twenty-nine years of age at his appointment, and from then till the end of his life his career was one continued success, not only in obstetrics, but in gynecology, in medicine, in surgery, and in archaeology. It is, however, with his obstetric work that this communication is specially concerned.

It must always be kept in mind that the Edinburgh Chair of Midwifery was the very first of its kind, and, as Professor A. R.

Simpson has pointed out in his *History of the Chair of Midwifery*, Joseph Gibson, who was the first occupant, was the first person who ever received the title of Professor of Midwifery. The Town Council in founding the Chair were, as Sir Alexander Grant says, unconscious that they were doing something original, and not following a precedent. Midwifery had always been till then the Cinderella of medicine, neglected and kept back, and its due merits unrecognised. Edinburgh had the honour of being the first university to have a teacher set apart wholly for the purpose of instructing in this most important part of the science of medicine, without which the occupation of all the others would be gone.

The practice of the art also held an unenviable position in the profession, and the practitioners of obstetrics were looked down upon by surgeons as men engaged in an inferior sort of art. The College of Physicians of London and the College of Surgeons of Edinburgh did not examine in midwifery, and it was only in the century that has just closed that a determined effort was made to raise obstetrics to a position worthy of its importance and interests. In 1825 an Obstetrical Society was formed in London, in 1838 in Dublin, and in 1839 in Edinburgh.

The Edinburgh Society originally consisted of twenty members, of whom Simpson was one of the most active and prominent. The Society has been at work ever since, and its meetings have been reported regularly in the *Edinburgh Medical Journal*. In this Society were read many of the most important papers which Simpson's original genius was always pouring forth. From small beginnings the Society has developed into a large Society of influential and active Fellows, regularly publishing transactions of no small scientific interest and value.

Beyond doubt, if Simpson had done nothing else than apply ether to obstetrics, and afterwards discover chloroform, he would have gained for himself imperishable fame in the department. It was in 1847 that he wrote his first pamphlet on chloroform, and it is quite unnecessary after this lapse of time, and with sixty years' experience of it now, that its advantages in midwifery should be discussed.

It is interesting to quote the words of a review of this pamphlet—"And doubtless our good friend Professor Simpson, who must be held responsible for the present sacrilegious attempt to do away with the prime curse on womankind, like a legitimate and faithful son of Apollo and Lucina as he is, was well aware

of this before he set about preaching the crusade of obstetrical etherisation to his brethren. And verily the craft is here in no danger, even if the Professor's most sanguine anticipations should be realised, which we are told go to this extent—that fifty years hence ether will be so universal in midwifery that pain will be the exception not the rule, and that the mothers of future men will bring forth, not in travail and the woe of the mortal couch, but in Elysian dreams on beds of asphodel.”

Anæsthesia, along with antiseptics, has been the foundation of all advances in midwifery. Without these, operative midwifery would have made but very little advancement, and gynecology none at all.

The rules that Simpson laid down for the administration of chloroform in obstetrics have undergone no change during the sixty years it has been in use. For example, “begin towards the end of the first stage, give it during pains, and withdraw it in the intervals. Give small doses or repeat them every second or third pain, when the chloroform affects the action of the heart or uterus. These cases are very rare. As the second stage progresses make the anæsthesia so complete as to destroy all sensibility. Remove chloroform as soon as the child is born.”

His simple handkerchief remains to the present day just as useful and convenient as any of the numerous inhalers. He did not believe that any circumstances should interfere with the full administration of chloroform. He made but one exception, namely, mitral disease of the heart, and he says “this is the only affection where I have the least hesitation in administering chloroform. There is perhaps no necessity for this after all.” It is certain that whatever accidents may have occurred with chloroform in general surgical practice its safety in obstetrics is beyond dispute. Very few indeed are the reports of any serious complication with anæsthesia, even in severe obstetric operations, or the long-continued use of it.

Amongst the more striking of Simpson's works was the persistent war he carried on against the nature and conditions of the lying-in and other hospitals of his time. One cannot but agree that he was actuated by the highest motives in doing so, and that the campaign he carried on was ultimately for their best interests.

If Simpson's contentions and statistics, so laboriously compiled, were true, or anything approaching the truth (and there is no reason to suppose they were not), then his contentions were unanswerable.



In 1848 he wrote in the *Edinburgh Journal*—"There are few or no circumstances which would contribute more to save surgical and obstetric patients from phlebotic and other analogous disorders than a total change in the present system of hospital practice. I have often stated and taught that if our present medical, surgical, and obstetric hospitals were changed from being crowded palaces with a layer of sickness in each flat, into villages or cottages with one, or at most two, patients in each room, a great saving of human life would be effected; and if the village were constructed of iron (as is now sometimes done for other purposes) instead of brick or stone, it could be taken down and rebuilt every few years—a matter apparently of much moment in hospital hygiene."

At the time Simpson wrote there could be no question that there was a greater mortality in hospitals than in out-patient practice, and the question in dispute was whether a high mortality was a necessary adjunct of hospital delivery. In other words, if hospitals were in every respect well managed, would they yield such a high death-rate? The fact remained at any rate that at that time the chances of a woman passing safely through confinement were less likely in hospital than in private practice. Now the condition is exactly the opposite.

It is needless to discuss the question of lying-in hospitals now, because Semmelweiss's discovery and Lister's wonderful work have revolutionised our ideas upon that subject completely, and practically stamped out septicæmia both in general and obstetric hospitals. Nevertheless Simpson's work on hospitalism will remain a monument to his largeness of heart as well as to his enormous industry.

In regard to puerperal sepsis, the teaching of Sir James Simpson was that infection was generally carried by the hands of attendants, and now this is the general opinion. If I were to state that where there was no handling there is no infection, I should not be very far from the truth.

It is remarkable how accurate Simpson's teaching was, and it has been verified to the full by the study of the bacteriology of the vagina and vulva. The work done in this department shows beyond question that the uterus and upper vagina are practically sterile, and that the whole of the micro-organisms are carried from the vulva.

It would be altogether impossible in this short sketch to follow out the evolution of the forceps from the time of Chamberlain, through its modifications by Levret and Smellie

onwards. Some idea of the desire to modify and improve the instrument may be gained by glancing at Witkowski's *Obstetrical Arsenal*, in which are pictured several hundreds of forceps. But there is no question that one of the most eminently practical additions to obstetrics, which can be credited to Simpson, is the introduction, in 1848, of the forceps so long associated with his name, and which, in response to his teaching, has been most commonly employed by those taught in the Edinburgh School. It consists of a pair of long forceps intended and adapted for application either above, at, or below the brim. The features of these forceps are familiar to all of us, and the instrument as constructed by him was a model of what forceps ought to be. It remained so until A. R. Simpson, early realising the principle of axis traction so clearly enunciated by Tarnier, adapted it to the original Simpson's forceps. It is not too much to say that the original Simpson's forceps so modified is the form that appeals most to scientific obstetricians at the present day, and its use as a life-saving instrument has been enormous. With such forceps delivery can be accomplished with scientific accuracy.

Simpson's wonderful ingenuity and powers of accommodating common objects to scientific use were admirably shown in his adaptation of the common "sucker" as an aid to delivery. Although this ingenious contrivance ultimately came to nothing practically, yet it was in itself a remarkable testimony to his rare powers of observation.

A glance at the advancement of obstetrics within the last hundred years does not show the introduction of any very novel operative measures. Indeed, all the operations and interferences at present in vogue were known to the profession a hundred years ago, although they have been marvellously improved, and their mortality strikingly decreased. But great though these improvements have been, no absolutely original instruments have been devised so far as obstetrics is concerned. For the operation of embryuleia Simpson specially devised a greatly improved perforator which has been most generally adopted by the profession since. A closer acquaintance with the mechanism of labour and an early recognition of pelvic deformity has, however, made it possible, for the most part, to avoid, except under unusual circumstances, the sacrificial operation.

There is no more remarkable chapter in the history of obstetrics than Cesarean section. Its origin dates far away back in the mists of the past, and it remained a more or less

discredited operation until the latter half of the last century. Its record within the past four decades has been a brilliant one, and now when this operation is undertaken, where the patient is unexhausted, and the tissues uninterfered with, it can be performed with almost certain safety to both mother and child.

Within recent years the remarkable success which has been associated with the operations for enlarging the bony pelvis, and the endless improvements in manipulations in all forms of obstetric interferences, are such that it is now possible to deal with most obstetric complications and emergencies with comparative safety. Though the names of numberless distinguished obstetricians are associated with the development and perfection of these operations, it would be impossible for a single moment not to acknowledge here the enormous debt the obstetrician owes to Lister. Yet it must remain for ever one of the glories of obstetrics that Simpson's original application of anæsthesia to obstetrics rendered these improvements possible.

Amongst his more important contributions to obstetrics was his resuscitation of the operation of turning as a substitute for craniotomy in narrow pelvis. Although turning in narrow pelvis was no novelty, having been practised long before Simpson's time, yet it had fallen into desuetude, and to him is due the credit, not only of reviving the operation, but of placing it on a sound scientific basis, showing the exact reasons why in a narrow pelvis a child can be born more safely as a footling than in the ordinary way. He recognised for the first time that the fœtal cranium is of conical form, enlarging from below upwards, and as the child passes, the narrow part of the wedge enters first; and he further recognised that the narrow bi-temporal part may be artificially adjusted, so that it becomes engaged instead of the bi-parietal.

To prove his contention of the maternal and fœtal advantage gained by turning as a substitute for craniotomy he showed from calculations, that the mortality attendant on parturition increases in a ratio progressive with the increased duration of labour. He urged this mortality as one of the strongest arguments against craniotomy, and in favour of turning, the turning being undertaken earlier in labour.

In 1841 Simpson wrote:—"No surgical operation whatever is, abstractly considered, more revolting to human nature than that of craniotomy. It is at the best a dreadful expedient. In too many instances it implies a direct and deliberate murder of a fellow-being by the hand of the accoucheur. It is one of the

operations the propriety or non-propriety of which has engaged all the logical subtlety of metaphysicians."

Simpson established his point, and the use of turning as a method of dealing with a narrow pelvis and saving both the foetal and maternal life was fully recognised and constantly resorted to. Perhaps no communication that Simpson ever made on a purely obstetric subject was worked up with greater elaboration and care than this, and it is only now that, thanks to chloroform and antiseptics, to axis traction, to operations on the bony pelvis, and to the perfecting of abdominal sections, turning for this purpose is less employed than it used to be.

The duration of pregnancy has ever been the subject of much discussion. Simpson went into the matter fully, and those who have heard him lecture will remember his vivid record of the Gardner peerage case, a case that gave rise to so much difference of opinion at the time.

Simpson admits that pregnancy may be protracted, and the evidence seems to be in the main satisfactory; but why it occurs, there is, of course, no absolutely definite knowledge. The most philosophical explanation of the occurrence would appear to be that which attributes impregnation to fertilisation just before the period of menstruation, which it anticipates and prevents. But that does not account for all. It is a subject exceedingly difficult of investigation, owing to the impossibility of getting reliable statistics.

Simpson investigated the well-known observations of Lord Spenser, and one can recall the endless tables of Spenser and Tessier on the possible protraction of gestation. It is in the same communication that he discusses the determining causes of labour, and for the first time propounds his well-known hypothesis of fatty degeneration of the decidua.

Amongst the interesting investigations to which Simpson devoted himself was "the sex of the child as a factor in parturition," and the twelve propositions, which he elaborated from a vast accumulation of statistics, are generally accurate, even to the present time.

Again, in a series of interesting papers he discussed at length the much vexed question of the position of the fetus *in utero*, a point which has engaged the attention of many obstetricians. He propounded the theory that the position of the fetus is due, in the first instance to a succession of reflex or adaptive movements—a theory to which, after trial of many others, the opinion of the profession has again reverted.



His dissertation on placenta prævia must have been a great surprise to the profession of his time, and must have produced a considerable impression. His novel and ingenious proposal that the placenta should be entirely detached was, to say the least, a very bold, as it was certainly a very original, proposal. It gave rise to much discussion at the time, and although this contribution was, as far as observation and reasoning are concerned, one of the most celebrated he ever made, yet it need not be extensively referred to here, for our present knowledge of the placenta and of the anatomy and physiology of the lower uterine segment has entirely altered our views on this important subject.

Simpson as a teacher and lecturer was unrivalled. Those of us who were privileged to listen to him never failed to realise his powers of effortless persuasion, illuminating with sudden and unexpected interest what seemed insignificant details, and fixing a principle by some apt illustration, making it impossible for one to forget it.

What gave weight to his teaching was the immense store of knowledge that lay behind it—knowledge which had been acquired through that capacity for hard work which characterised his life throughout, and was based not so much on the labours of others, as on the patient trustful study of human nature itself. That, I think, which was distinctive of, and gave special character to his teaching, and which no amount of knowledge acquired at first or second hand could have given him, was that indescribable something called genius, and with Simpson genius was vision. His were not so much formal lectures written with studied purpose, but rather eloquent talks in which he came down, as it were, from his chair and sat side by side with his students, and endeavoured to make them see as he saw.

Some of his utterances were almost prophetic, as when once he startled us by his statement that one day not very far distant, by the applications of science, the human body would become diaphanous, a prophecy which has been fulfilled almost to the letter. None of us who heard his last graduation address is ever likely to forget how he foreshadowed not only this, but also had the prescience to foretell what has actually become the case, that in another generation we should be ballooning through the air.

Simpson did not need to seek for words, words came unsought—apt, persuasive, and unforgettable—because he was not explaining a theory, or propounding a speculation, but simply describing what lay clear before his mental vision. And thus it was, that he was

enabled to deal with his subject with such perfect ease, turning it round and looking at it in all its different relations, and finally placing it in the sparkling light of some humorous or pathetic story. He had a great fund of anecdotes, and was an excellent story-teller. Simpson's teaching, for all who heard it, was a possession for ever. One is carried back to a class-room filled to overflowing with an eager crowd of students, amongst whom were a large sprinkling of strangers, many of them not even members of the profession—a feature this, by no means common in classes of literature or art, but surely unique in classes of medicine—of medicine at least in Simpson's department!

Simpson has left behind him no single work on obstetrics. He did not occupy his time with producing volumes, far less text-books. His mind was too prolific, too acute, too active, for the drudgery of books. He had neither the time nor the desire, I presume, to write text-books. His literary work in obstetrics consists of essays and brochures, many of them short, but all of them thorough and complete, and I think one may safely say that his published work contained absolutely no padding. It was the result of his own investigation and was readable through and through. It would have been absolutely impossible for him to have written a book after the German fashion. His essays are all bright, interesting, argumentative, and it is impossible to suppose that one who wrote on so wide a range of subjects, and one who enunciated so many original ideas and theories, could fail to meet with much opposition. Thus it is that his writings are characterised by the endless force and energy which he had always at hand to support his own views. It is needless at this time of day to say that they were models of work, full of ripe experience and widely extensive knowledge of literature. It is wonderful that he wrote as much as he did, because a busier man than Simpson could scarcely be imagined, and in producing as much as he has done one is lost in admiration of his application and powers of perseverance, and of his ability to utilise every moment of his time.

As a pure obstetrician Simpson's reputation rests on three factors:—Firstly, upon his introducing anæsthesia into midwifery, which, after all, was his outstanding glory, and which, as I have already said, overshadows all his other work. Secondly, on the vast field over which his researches extended, and the striking manner in which they affected the obstetric practice of his time. Quite a large number of his communications to midwifery have become

obstetric classics. Thirdly, on his fame as a teacher, on which I have already dwelt.

To my mind, apart from the discovery of chloroform and its application to obstetrics, the greatest, the permanent gift he bequeathed to the profession, was his own keen enthusiasm, which he was able to impart to others. He thus became the founder of a school of obstetricians whose names are indelibly printed on the pages of every obstetric volume.

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## SIMPSON AS GYNECOLOGIST.

By A. H. FREELAND BARBOUR.

GYNECOLOGY was a new science when Simpson came to it. A first glance does not show the greatness of his contribution, for his was the *Grundwerk*, and foundations never catch the eye.

It had not yet become a specialty, and in estimating the extent of his contribution we must not compare it with that of specialists since, who have been gynecologists and nothing more. Gynecology was only one of many things his genius touched and transformed.

Diagnosis must come before treatment. Simpson saw this, and while he introduced new methods of treatment, his great and lasting contribution was to diagnosis. He found the gynecologist working with only a speculum and the vaginal method of examination, his area of investigation limited by the inadequacy of the instruments. He left him provided with sound, cervical dilator, exploring needle and anæsthesia, which brought within range the *terra incognita* of the uterus and tumours beside it.

There are two kinds of discovery, those bearing on the science and those on the art of a profession. The former is that of something not *known* before, the latter that of something not *done* before. Simpson's discoveries belong to the latter class. He did not discover the sound in the sense of making it, nor was he the first to put it to the specific use of measuring the uterus. Others had done that before, but the sound lay there still unused for they had not been able so to demonstrate its value as to lead to its general use. Here Simpson stepped in. As genius in science gives expression to a thought which may have been in many minds but which no one has put into words, so genius in art, by which we mean applied knowledge, picks up a tool and uses it in such a way that others are constrained to use it also. Thus it happened that before the time of Simpson no British gynecologist used the sound, but after him every one did, and its general use is the best evidence of the importance of the discovery. Genius in art consists not only in seeing the value of a tool but in making others see it also.

In operative gynecology Simpson's name is associated with several minor gynecological operations, and, while major operations were a subsequent development, he saw the great future





No. 52 QUEEN STREET, EDINBURGH.

Between the windows of the centre house there is now the inscription "Sir James Young Simpson lived in this house from 1845 to 1870, and in 1847 discovered the anæsthetic powers of chloroform."



before ovariectomy though he made no contribution to its technique. Yet brilliant and beneficent as the development of that operation has been, were the gynecologist to-day asked whether he would rather have the reputation of having introduced the uterine sound or developed ovariectomy he would undoubtedly say the former.

It is noteworthy and characteristic that Simpson did not write a book. Numerous communications there are, touching on every subject, rich in suggestion, yet he had not the time nor inclination to collect and edit these. Not that he did not appreciate the value of gynecological literature. His papers bristle with references from many languages and from collateral sciences, and often contain allusions to ancient writings which shows his antiquarian bent. Hence, to form an estimate of his work in gynecology we must turn to a collection of his papers made in 1855 by his assistants Priestley and Storer, or to his "Clinical Lectures on the Diseases of Women,"<sup>1</sup> as taken down by his later assistant A. R. Simpson (now Sir Alexander), who succeeded him in the Chair.

Were we to select the most important contributions to gynecological diagnosis and arrange them chronologically, they are:—

1843. "Memoir on the Uterine Sound."

1844. "Mechanical Dilatation of the Cavity of the Os and Cervix of the Uterus as a Means of Diagnosis and Treatment in some Affections of that Organ."

1848. "On Retroversion of the Unimpregnated Uterus."

1850. "On the Detection and Treatment of Uterine Polypi."

1850. "On the Use of the Exploring Needle in the Diagnosis of Doubtful Forms of Pelvic and other Tumours."

1851. "On Uterine Diagnosis."

1852. "Morbid Deficiency and Morbid Excess in Involution of the Uterus after Delivery."

1855. "On the State of Artificial Anaesthesia as a Means of facilitating Uterine Diagnosis."

Foremost among these we place the monograph on "Uterine Diagnosis." It marked a new era. Till then attention had been concentrated on symptoms, for the obvious reason that there were no methods of physical diagnosis beyond the vaginal examination and speculum. This paper brings out two characteristics of Simpson's work—his appreciation of all that was of value in the past and in the work of other men, coupled with readiness to adopt new methods, and his insistence on the necessity of accurate

<sup>1</sup> Many of them appeared in the *Medical Times and Gazette*, but the complete series was not published till after his death.

observation in clinical work, of which he furnished himself a notable example. Further, we are struck with his appreciation of the findings of pathology and the necessity of a pathological basis—"And first of all I would earnestly beg you to hold this important fact in view, namely, that the diseases of the uterus do not essentially differ in their principles of pathology and treatment from the diseases of other individual organs of the body. . . . Modern pathology has made great advances in the management of uterine disease. These advances, however, have not, let me repeat, consisted so much in finding out that the uterus is the seat of any new or any peculiar affections, as by finding out means and methods by which we can detect and diagnosticate affections that are actually present in it. . . . The great progress in medicine of modern times has consisted not so much in the detection of any new principles of therapeutic treatment as in the detection of appropriate means for enabling the practitioner to detect and discover in different individual organs what the actual diseased actions are."

The "Memoir on the Uterine Sound" is, however, that with which his name will always be associated.

It is difficult now to put ourselves in the position of those whose chief method of gynecological diagnosis was the vaginal examination, whose horizon was limited by the rim of a Fergusson speculum, to whom the uterus was an unknown land. This was the position of gynecological diagnosis in Britain when Simpson appeared. To say that he introduced the uterine sound and with it precision into our knowledge as to the size and position of the uterus may not seem much, and yet it is the foundation stone of gynecological diagnosis as far as the uterus is concerned. Subsequent advances in gynecology have substituted other methods where the sound was the only one. Bimanual examination has enabled us more safely if not more adequately to determine the size and position of the uterus, and asepsis has made the use of the sound an occasional instead of an essential part of examination. Still the fact remains that Simpson extended the field of examination from the vagina and cervix to the uterus, and made it possible to ascertain with precision the size and position of that organ. Further, through the use of this instrument he was led to study the size of the uterus as influenced by the puerperal condition, by tumours and inversion, and its position in retroversion and prolapse. Not that these conditions were not known before from pathology, but he gave the complete clinical demonstration and description.



To say that the "Memoir on the Sound" is a milestone on the road of clinical diagnosis of uterine disease gives no idea of its significance. Rather it stands at a point on the road from which an extensive view of the whole area of physical diagnosis of pelvic disease was first obtained. We can best appreciate the significance of this discovery by quoting the propositions laid down and discussed in the original memoir. After stating that "physical examination as hitherto practised seldom enables us to ascertain accurately the organic condition of more than the cervix and lower part of the body of the uterus," he says: "It is possible by the use of a uterine sound, a bougie introduced into the uterine cavity, to ascertain the exact position and direction of the body and fundus of the organ—to bring these parts of the uterus, in most instances, within the reach of tactile examination, and to ascertain various important circumstances regarding the os, cavity, lining membrane and walls of the viscus."

Then follows a description of the instrument and its mode of use:—"The sound increases to a great degree our power of making a perfect and precise tactile examination of the fundus, body, and cervix of the uterus. By the use of the uterine sound we may, in many instances of pelvic and hypogastric abdominal tumours, ascertain the connection or non-connection of these tumours with the uterus. The uterine bougie is capable of affording valuable diagnostic information by enabling us to measure the length of the uterine cavity."

These propositions are followed by a careful clinical description of the elongation of the puerperal uterus as a sign of delivery, and of the increased length in matritic and congestive hypertrophy of the body of the uterus; of elongation of the cervix: of hypertrophy of the uterus from the growth of fibrous tumours in its parietes or from polypi in its cavity. A preternatural shortness from original malformation, from partial obliteration of the cavity, and from inversion is also described. The subject is illuminated by references to these different pathological conditions gathered from all sources, showing an acquaintance with gynecological literature of all languages and periods which, however familiar to-day, is rarely met with in papers of that period. The state of gynecological knowledge before the days of the sound<sup>1</sup> was often

<sup>1</sup> Simpson never claimed that he was the first to use a uterine probe. In a later paper (1854) he showed that the introduction of a sound into the uterus is repeatedly mentioned in Hippocratic writings, and is alluded to in Avicenna and some Arabian authors, and in the sixteenth and seventeenth

that cleverly expressed by Velpeau—*la doute est la seule opinion rationnelle*.

The use of the sound in the diagnosis of retróversion will be found in a separate paper on "Retróversion of the Unimpregnated Uterus," which appeared in the *Dublin Quarterly Journal of Medical Science* for 1848.

Of the various pathological conditions revealed by the sound, the name of Simpson is specially associated with the description of Sub-involution and of Super-involution. Enlargement of the uterus in its naked-eye pathology had already been described by many writers, but he gave its clinical demonstration, and by the introduction of the term sub-involution related it to its most frequent and significant cause—interference with normal involution. He was the first to describe what he calls a morbid excess of involution or reduction in the uterus after delivery, which he calls super-involution. This condition was unknown to gynecological science until he described it in his paper on "Morbid Deficiency and Morbid Excess in the Involution of the Uterus after Delivery," which appeared in the *Edinburgh Monthly Medical Journal* for August 1852.

Next in importance to the use of the sound comes mechanical dilatation of the cervix, so as to enable the finger to be introduced into the uterine cavity. The sponge-tent had already been used in surgery, but the sponge had been steeped in preparations of wax requiring heat to dissolve the wax and cause expansion. Simpson employed a solution of gum, and the secretion of the canal afforded moisture for the solution of the gum and expansion of the sponge. In his original communication it is not so much the use of the sponge-tent as the desirability and necessity of dilating the cervix so as to get the finger into the uterine cavity which impresses the reader. It is not so much the method that he employed as the demonstration of the possibility and advantages of cervical dilatation in certain cases. Hence, while the sponge-tent has been replaced by other means of dilatation, the discovery of the principle and the necessity of dilatation of the cervix will always be associated with Simpson's name.

In his later paper on the "Detection and Treatment of Uterine Polypi" (which appeared six years after the original paper on the sponge-tent) he shows the value of this principle as applied to the

centuries by other writers. Dr. Mackintosh of Edinburgh previously used it as a mode of treatment, but as a means of physical diagnosis it belongs to Simpson.

detection of intra-uterine polypi, which up to that time had been described "as entirely beyond the reach of legitimate diagnosis and treatment." Patients had died from uterine hæmorrhage whose lives might have been saved. "If art could furnish us with any means of producing at will the same extent of opening of the os uteri [as is found when it has been dilated by a polypus] so as to enable us to feel the 'rounded tumour within' with our finger, we would possess a power of detecting with all the certainty of physical diagnosis the existence of disease within the cavity of the uterus." This Simpson discovered in the sponge-tent. The paper gives a series of cases in which a diagnosis of polypi had been made by this means, and contains an interesting reference to the value of the bimanual examination, which is often spoken of as belonging to a later period. The passage is so important that we quote it in full:—

"In making this examination, as in making most other examinations of the uterus, a rule requires to be followed which is too often forgot, namely, to use both hands for the purpose. For if we are examining the uterus internally with the forefinger or fingers of the right hand, the facility and precision of this examination will be found to be immensely promoted by placing the left hand externally over the hypogastric region so as to enable us by it to steady, or depress, or otherwise operate upon the fundus uteri. The external hand greatly assists the operations of that which is introduced internally; and, further, we can generally measure, between them, the size, relations, &c., of the included uterus."

Of less absolute value now in diagnosis but a new idea at that time was the exploring needle. With the bimanual supplemented by abdominal section to-day we can scarcely realise the significance, to the gynecologist of that time, of this means of determining whether a tumour beside the uterus contained blood, serum, or pus, or was an ovarian cyst. Surgeons had already used the needle for this purpose in cases of doubtful tumours, but its application to gynecological cases we owe to Simpson.

Of a different kind from these three methods of diagnosis but even more far-reaching in its significance to-day is the use of anesthesia as an aid to gynecological examination. This application of his immortal discovery may not appeal to the imagination as much as the gift to woman in labour of a dreamless sleep, yet it is difficult to exaggerate its value to the gynecologist in cases of doubtful diagnosis due to difficulty in making an examination.

Every now and then cases present themselves in which diagnosis would be impossible without the aid of chloroform.

In laying the foundation of gynecological diagnosis Simpson's contributions stand out clearly defined, and it is easy to select the significant, but when we come to treatment his contributions are so varied and of such unequal merit that we are lost in detail. What strikes one is his resource. Every possible line of treatment was adopted, and every new remedy was tried. Perhaps the most important, apart from gynecological operations, was that of replacing the retroverted or prolapsed uterus and retaining it in position by pessaries. To him we owe the re-position of the retroverted uterus by the sound and its retention, in the first instance, by intra-uterine stem pessaries, for which he subsequently substituted the safer vaginal pessary. It is interesting that the first form of this was made by a patient herself out of gutta-percha, and Simpson was in the habit of using a modification of this instrument until Hodge devised the special form of vaginal pessary with which his name is associated.

The detection of morbid conditions of the uterine mucosa by the sound was naturally followed by the application of caustics to its surface; and various applications were made to the cervix and vagina in the form of medicated pessaries, which he first introduced into practice and which became extensively adopted.

Passing to operative gynecology, we select the following as his most important contributions, again arranged chronologically: —

1841. "On Amputation of the Neck of the Womb."

1844. "Dilatation and Incision of the Cervix Uteri in Cases of Dysmenorrhœa."

1846. "Excision of the Cervix Uteri."

1855. "On the Excision of Large Pedunculated Uterine Polypi."

1864. "Successful Case of Ovariectomy."

Operations for Vesico-Vaginal Fistula and the Removal of the Coccyx in Coccygodynia as described in his Clinical Lectures.

It is interesting to note that one of Simpson's earliest papers was on amputation of the cervix. In 1841 he quotes Dr. Churchill as saying: "I am not aware that any attempts have been made in Great Britain to excise the cervix uteri," and records a case in which he had done it successfully for cancer of the cervix. The operation was done with the patient lying on her face, with the



lower extremities hanging over the bed. The cervix was excised as high up as the reflection of the vagina would permit. The operation was performed in the early months of pregnancy. The patient went to term and lived for many years, giving birth to several children. A careful description is given of the naked-eye and microscopic characters of the tumour. In a later paper he reports on eight more cases and discusses the advantages and limits of the operation.

The treatment of dysmenorrhœa and sterility by dilatation and incision of the cervix is another operation for which we are indebted to Simpson. For its performance he introduced a special instrument, a kind of lithotome caché. The instrument has been discarded but the principle of treatment remains. For the removal of polypi he devised the polyp tome. In the operation for vesico-vaginal fistula he employed iron wire sutures, and devised ingenious methods of fixing them so as to secure exact apposition of the margins of the wound.

Of Simpson as a gynecologist we have the finest portrait in his "*Gynecological Lectures*." These were not composed for publication but were taken down as he spoke them, and reveal the greatness of his personality. They differ from his "*Memoir on the Sound*" and other communications in the absence of numerous allusions to the literature of his subject. In the "*Memoir*" there are some seventy-two references to French, German, Italian, and English authorities. On the other hand, the "*Lectures*" are full of allusions to a rich and varied clinical experience.

Schröder, the leading German gynecologist of his day, speaking about Simpson, remarked on hearing how restricted his hospital opportunities were: "What an enormous practice he must have had, and to what good account he turned it!"

It has fallen to few, if to any in this country, to have had the clinical experience he had, and his students got the benefit of it. We know of no series of clinical lectures in gynecology which can be placed alongside of these.

Gynecology stood like a rich harvest field waiting to be reaped, but the instruments had not been provided. Simpson brought these, and such store of corn fell to his scythe that those who followed appear only as gleaners. It was not till abdominal section came in that a like sudden accession to gynecological knowledge was possible. His clinical descriptions of enlargement, atrophy, and displacements of the uterus, of fibroid tumours and cancer, form a classic to which gynecologists will always turn.

Subsequent work has only filled in details chiefly from the domain of microscopic pathology. The clinical picture in its bold outline stands true for all time; it will live because it is true to nature, and has the strength of being work at first hand. It is a faithful picture of what he saw for himself and in some cases was the first to see.

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## JAMES YOUNG SIMPSON.

AN APPRECIATION OF HIS WORK IN ANÆSTHESIA AND OF  
SOME OF HIS OUTSTANDING PAPERS.

By D. BERRY HART, M.D., F.R.C.P., Edinburgh.

"Simpson ist unzweifelhaft der fruchtbarste geistreichste, berühmteste Lehrer der Gynäkologie Grossbritanniens, um die Mitte des vorigen Jahrhunderts gewesen, und hat ebensosehr als Lehrer wie als Arzt wie als Operateur, Schüler und Kranke aus allen Teilen der Welt angezogen."

F. VON WINCKEL, München.

IN the nineteenth century obstetrics advanced along three great lines, and in two at least of these Simpson took a leading part. The first was that of the development of anæsthesia. In the second, the question of puerperal septicæmia and its prevention was the principal theme. In the third, the nature of the advance was more of a general nature—the application of the scientific methods of other branches of science to the clearing up of the various unsolved problems in midwifery. With the second of these the great names are those of Pasteur, Lister, and Semmelweiss; and while Simpson could not be said to have taken the leading part in this investigation, he was at all times highly sympathetic to Semmelweiss's work if not at first to Lister's. He also drew attention, almost at the same time as Semmelweiss, to the contagious nature of puerperal fever and to the analogy between an operation-wound and the bared placental site.

Simpson's position in relation to anæsthesia has been to some extent misunderstood. He was not the enunciator of the general idea of anæsthesia. That really has been in the mind of mankind since the days of Genesis and earlier, and throughout old literature we have allusions to some process by which the surgeon during operation made his patient unconscious. The late Professor Gusserow of Berlin quotes, in relation to Simpson's work, from Middleton's tragedy, *Beware of Women*, published in 1657, the passage—

"I'll imitate the pities of old surgeons to this lost limb, who  
Ere they shew their art,  
Cast one asleep, then cut the diseased part."

Humphry Davy drew attention to the anæsthetic effects

of nitrous oxide gas in dentistry, but it is to Morton and Wells of America that we owe the first great step, inasmuch as by means of ether they showed that patients could be fully and safely anaesthetised during a major operation. It cannot be said that in regard to their discovery they took the high professional tone that Simpson did, and therefore when a year afterwards Simpson, after much research and great risk to his own and to his assistants' lives,<sup>1</sup> discovered the convenient and less irritating chloroform, the progress of anaesthesia was accelerated in the most remarkable manner. Simpson proclaimed his discovery at once, especially drew attention to its great use in midwifery, was the first to administer ether and chloroform in labour, and in this way gave an impulse to the progress of the American discovery which has been of incalculable value.

It is remarkable that Simpson, who was afterwards followed in this by Syme and Lister, gave an excellent practical method for the administration of chloroform. He used the open system, gave the drug freely, put the patient well under so as to abolish reflexes, and made the state of the respiration the great guide to the safety of the patient. The principles then laid down still hold good in my opinion, although of course as time passed it was seen that the whole question of its effect on the patient was much more complicated than was at first imagined.

The debatable points soon emerged, and have been and still are the following, namely, what percentage of chloroform vapour should the patient inhale? how far should anaesthesia be pushed during its administration? what are the immediate and ultimate dangerous results to the patient in chloroform inhalation. Lister was one of the first to work at the question of the percentage employed in the open method, and in an article on "Holmes's Surgery" came to the conclusion that under it 4·5 per cent. chloroform vapour was given, a percentage therefore much below the 9·5 per cent. of Snow. This question of the percentage of chloroform vapour necessary has been worked out more recently by Waller and others, and various ingenious apparatus have been constructed to keep the chloroform vapour within the alleged bounds of safety.

In England, anaesthetists early advocated the use of a special apparatus, but while this has continued to be the custom in that country, it has not spread in Scotland, America, or Germany.

<sup>1</sup> Dr. George Keith and Dr. Matthews Duncan were with Simpson when the first experiment with chloroform was made.



This subject will be found ably and impartially discussed by Hewitt, but it is evident that what we want for general practice is a simple method of giving the drug safely by an open system. It would take too long to detail the results of the two Hyderabad Commissions and of Waller's work, but, upon the whole, the open system, the free giving, and watchful attention to the respiration, still form an excellent method of administering chloroform, one that, like very many others in Edinburgh and elsewhere, I have always used and from which I have seen no bad effects.

Many cases of sudden death during chloroform have been recorded, but it has not yet been settled that this is due to the action of chloroform on the nerve centres or on the heart itself. There has been bound up with many of these cases the fact that chloroform has not been fully administered, and that the patient at the time of death showed by some movement that the reflexes had not been properly abolished. This has been drawn attention to by Lauder Brunton and others, but even at the present time the risk of the incomplete administration of chloroform, leading to an imperfect abolition of the reflexes as a factor in producing sudden death by shock, is not yet sufficiently grasped.

Undoubtedly the sickness induced by chloroform is in many cases very distressing. The same is noted, of course, after the use of ether, although it is said to be to a less extent. So far as we understand the question it is a result which we have no means of avoiding.

The late effects of chloroform, what is known as delayed chloroform poisoning, have come into prominence within the past few years, and it is an undoubted fact that, although comparatively rarely, such may happen. In many hundred cases I have seen only one, but it is a remote danger that must be kept in mind.

The old dispute of chloroform *versus* ether should be given up. Chloroform has held its own in a very remarkable manner, but new anaesthetics and novel methods of anaesthesia, general and local, are emerging, and to these the scientific practitioner of the day must give his best attention.

It cannot be claimed for chloroform that it is the best anaesthetic. Ether runs it hard, and in the opinion of many is a much safer drug. Be that as it may, chloroform is at any rate the more convenient anaesthetic. It is incomparably better than ether in midwifery and absolutely safe in this branch of our profession, and

if given in it and in surgery with due attention to the breathing, and pushed in major surgery so as to abolish reflexes, it is a drug in which the surgeon and obstetrician can have every confidence.

Simpson's share in anæsthesia, therefore, seems to be that he early appreciated the advantages of Morton's and Wells's discovery; that he was the first to employ ether in obstetrics and to show its use in that branch; that he discovered in chloroform an exceedingly convenient anæsthetic; that he did his utmost to further its use, and by his genius and his able advocacy spread the use of anæsthetics over the world in a way that no other man can be said to have done.

If we try to put into a summarised form the data which we have been discussing regarding the introduction of anæsthetics in America and this country, it appears to me that we might correctly state the whole matter fairly by quoting Simpson's own statement in regard to it.

"1. That on the 11th December 1844 Dr. Wells had, at Hartford, by his own desire and suggestion, one of his upper molar teeth extracted without any pain, in consequence of his having deeply breathed nitrous oxide gas for the purpose, as suggested nearly half a century before by Sir Humphry Davy.

"2. That after having with others proved, in a limited series of cases, the anæsthetic powers of nitrous oxide gas, Dr. Wells proceeded to Boston to lay his discovery before the Medical School and Hospital there, but was unsuccessful in the single attempt which he made, in consequence of the gas-bag being removed too soon, and that he was hooted away by his audience as if the whole matter were an imposition, and was totally discouraged.

"3. That Dr. Wells's former pupil and partner, Dr. Morton of Boston, was present with Dr. Wells when he made his experiments there.

"4. That on the 30th September 1846 Dr. Morton extracted a tooth without any pain, whilst the patient was breathing sulphuric ether, this fact and discovery of itself making a NEW ERA in anæsthetics and in surgery.

"5. That within a few weeks the vapour of sulphuric ether was tried in a number of instances of surgical operations in Boston—Dr. Morton being generally the administrator—and ether vapour was established as a successful anæsthetic in dentistry and surgery.

"6. That in January and the subsequent spring months, 1847, the application of sulphuric ether as an anæsthetic in midwifery

was introduced, described in our medical journals, and fully established in Edinburgh, before any case with it was tried in Boston or America.

"7. That on the 15th November 1847 the anæsthetic effects of chloroform were discovered in Edinburgh, and that it swiftly superseded in Scotland and elsewhere the use of sulphuric ether, and extended rapidly and greatly the practice of anæsthesia in surgery, midwifery, &c."

With the exception of the fact that ether has proved a more formidable rival to chloroform than Simpson at that time thought, what he claims for himself will be agreed to by most scientific men.

If we now take up the third line of advance, namely, the application of scientific methods to the clearing up of disputed problems in midwifery and to the improvement of obstetric operations, Simpson's papers take an exceedingly high place, and his contributions to the practice of version, to the treatment of placenta prævia, and to the questions of hermaphroditism and of the free martin are exceedingly valuable. On each of these I wish to give some estimate in detail.

In version, Simpson's contributions were three in number. He was practically the first man to show the great advantages of the use of the external hand in turning; *secondly*, he was the first to discuss and make a contribution to the question as to which limb should be drawn down in version; and, *thirdly*, he published an exceedingly valuable paper showing the advantages of version as a substitute for craniotomy in labour delayed by obstruction at the brim of the pelvis.

First, *the use of the external hand in version*. Paré in his great discovery as to version introduced the method of turning by passing the hand into the uterus and thus seizing a limb to deliver the child. Simpson showed that the external hand aided the internal hand by steadying the fetus and working in a combined way with the internal hand. He did not, however, put the matter quite precisely; that was done in this country by a very able obstetrician, the late Dr. Braxton Hicks of London, and his method was still further improved and made clear to the profession by Dr. Robert Barnes in his work on *Obstetric Operations*.

Second, *in the choice of the limb for version*, Simpson was the first to indicate that one limb was preferable, and he wrote an account of the first instance in which he used it, when the famous Martin Barry was his house surgeon. It is interesting to note

that in this case a full dose of opium was given to the patient by Barry before the turning was performed. It has not been generally observed that this case of Simpson's was a dorso-posterior cross-birth, and thus it was the more favourable position for the seizure of the higher limb, a seizure Simpson advocated as being the better in every case. Simpson advocated the higher limb because one could more easily turn, and stated that if one seized the nearer limb it might simply be flexed against the body and turning not effected. Galabin showed quite clearly that one could effect version by either limb, and he advocated the nearer limb as the one to be seized. His diagram is, however, that of dorso-anterior position. Nagel of Berlin showed that we should really seize the limb whose half breech made the small rotation, namely, a quarter of a circle instead of an excursus from the side of the promontory, past the promontory and so to the symphysis. The whole matter seems to me to be summed up in this, that in seizing the limb one must keep in mind the position of the fetus: in the dorso-posterior position the far limb should be seized, in the dorso-anterior the nearer limb; and thus the rule can be given for seizure of the leg in version where there is any difficulty in the process, namely, "seize that limb which *maintains* or *obtains* the dorso-anterior position."

In the third paper which we are considering, namely, "*Turning as an Alternative for Craniotomy and the Long Forceps*," Simpson made a notable contribution to practice. He did not differentiate in his cases between the flat or flat-rickety and the justo-minor pelvis, but he clearly indicates in his illustrations that the pelvis in which he advocated version was really the flat or flat-rickety. He also did not insist enough upon the limits of the conjugate for turning.

His arguments in favour of turning are most excellent. He insisted on the advantage of the base of the skull, narrower than the vault, entering the narrow conjugate: on the extension of the head bringing the bi-temporal into the conjugate instead of the bi-parietal; and on the aid to the passage of the head afforded by the overlapping of the parietals at the sagittal suture. That in a flat-rickety pelvis, in a multipara, with a conjugate of three and a half to three and three-quarter inches one can deliver more safely than by forceps, I do not entertain the slightest doubt.

The whole question was still more advanced, however, in an exceedingly able and graphic paper, by the late Dr. Goodell of Philadelphia, on "*Labor in Narrow Pelvis*," read at the Inter-



national Congress at Philadelphia in 1877. Here Goodell differentiated between the justo-minor and the flat-rickety pelvis, showing that the former was the case *ceteris paribus* for forceps, while he again emphasised the advantages of version in the flat-rickety pelvis. Controversy has always raged between the question of version and forceps in the flat-rickety pelvis, and recently the use of the axis-traction forceps has led to the reconsideration of the whole subject. Many hold that if the conjugate is at or a little above three and a half to three and three-quarters in a flat or flat-rickety pelvis, forceps are better than turning; and the late Dr. Milne Murray, who did so much for forceps technique, stated that if forceps were used, the bi-parietal diameter was not increased as Simpson used to urge, but that the increase in diameter took place in the vertical axis of the skull. I grant that in a pelvis of, say, three and a half to three and three-quarters, or slightly above this, forceps can deliver a fetus, but I do not agree that an increase of the head takes place in the vertical diameter of the skull and that the head does not telescope anteroposteriorly and therefore dangerously. I have, indeed, seen this telescoping very marked where the forceps had been applied in a flat-rickety case, and possess a cast of the head showing it clearly.

Upon the whole I think the wisest plan is to judge each case on its own merits. In a multipara with the forehead dipping and a conjugate of three and three-quarter inches I think turning gives a better result to both mother and child than forceps.

It is to be noted, however, that there is now a tendency on the part of obstetricians, much to be encouraged, to wait longer when the head is delayed at the brim with a conjugate above a three and a half inch diameter—a disposition to give the woman a little more time, so that the head may be moulded and driven past the obstruction. When once the head has passed or is moulding through the brim, the application of forceps is, of course, a much safer matter. However this question may end, Simpson's papers will always remain the most notable on the subject.

One of Simpson's contributions to which great exception was taken at the time, and over which a fierce controversy raged, was that on the spontaneous expulsion of the placenta before the fetus, and on the artificial extraction of the placenta before the child in placenta prævia. Simpson was to a certain extent misunderstood, as he only advocated this measure of entire separation in bad cases where the hæmorrhage was great and the parts rigid.

In ordinary cases he recommended the usual treatment adopted at that time, much of which we still employ.

It is interesting to see how Simpson defended his position. He showed that in certain cases the placenta becomes separated and expelled before the child is born. This process is termed prolapsus placentæ—a bad term, for which a better has not yet been suggested. This, however, is not the case in placenta prævia alone, as it may happen where the head is presenting and the placenta in normal position. A typical case of this is, for instance, one where the head is arrested at a narrow brim, the labour allowed to go on unduly, and where the practitioner is sometimes astonished to find the placenta expelled into the vagina, although the labour otherwise has made no progress. I have already discussed this question in another place. Prolapsus placentæ has thus, I believe, no special significance in regard to placenta prævia alone, and in some of Simpson's cases complications were present, such as transverse presentation, where the compacted and driven-down fetus arrested bleeding. Simpson defended the complete separation on the grounds, firstly, that the hæmorrhage ceased after such a prolapsus of the placenta, and that one reason of the hæmorrhage in placenta prævia was, that when the placenta, was only partly detached, bleeding took place *via* the uterine wall above the separation, through the detached part of the placenta. This is not held to be the case now, for the reason that the separated placental part is thrombosed and this will prevent blood passing. Experimental separation of the placenta in lower animals has also shown that the bleeding comes from the bare uterine wall and not from the separated placental surface. It is to be observed, however, that Bumm of Berlin still gives the separated portion of the placenta in placenta prævia as a source of hæmorrhage. The problem, indeed, could not be solved at that time by any man, however eminent, as the facts in regard to the anatomy of placenta prævia were not fully worked out. It was not known that the placenta was not attached to the cervix in such cases, and there was no knowledge of the differentiation of the uterus into the body proper and the lower uterine segment; the expansion and non-retraction of the lower uterine segment were unknown; and, further, the nature of the blood-vessel walls torn through was not so perfectly established at that time. We are now aware that the placenta is prævia when it is attached, in whole or in part, to the lower uterine segment—the expanding portion during labour—and in addition to the facts already mentioned it has

been ascertained that the walls of the vessels torn through have no muscular fibre but are thin-walled and therefore collapsible. While all this can be pointed out, it is still true that we cannot give a thoroughly good explanation of the arrest of hæmorrhage after separation of the placenta from the lower uterine segment. It was thought at one time (Hofmeier) that the branch to the lower uterine segment passed through the lower portion of the uterine body proper, and this would have helped to explain, in part, the arrest of bleeding; but unfortunately this observation has not been as yet completely substantiated.

Even with his imperfect data Simpson made a very triumphant demonstration of his position, and none of his opponents were able to overturn his arguments.

It may be asked now, What is proposed in modern times for such cases as Simpson tried to treat with complete separation of the placenta? The most recent answer is, by Cesarean section, first performed, curiously enough, by one of Simpson's greatest contemporaries and followers, Lawson Tait. This proposal is, however, rather a cutting of the Gordian knot than a real solution of the difficulty.

Many of Simpson's scientific papers are of a high character, such as those on "Puerperal Arteritis" and on "Albuminuria in Puerperal Convulsions," the latter written after Lever's work, where the quite modern summary given at page 296 of his *Selected Obstetrical Works* was penned in 1847. But probably the two most outstanding contributions are those on the free martin and his classical monograph on Hermaphroditism.

John Hunter was the first to write on the free martin, and his contribution is distinguished by the exactness and force, and swing as it were, of that great anatomist. Simpson took up the question from a purely human obstetrical point of view, discussing the alleged infecundity of females born co-twin with males. In this he showed, first, that there was not a higher average of sterility in such as compared with the ordinary population. He did not notice, however, that when in human twins there is a male and female, they necessarily come from separate fertilised ova: there is no free martin in human twins.<sup>1</sup> As we now know, the free martin in black cattle is usually a defective male, born co-twin with a perfect male, the only difference being that the free martin has defective sexual organs, namely, the epoophoron and the

<sup>1</sup> I think it probable that a single human or bovine free martin may exist, *i.e.* apart from twinning.

hydatid testis with a small portion of the male sexual gland, while the other has perfect sexual and male organs. Simpson concluded that the free martin was one of the strangest and most inexplicable facts to be met with in the study of abnormal development. A distinguished German obstetrician, Spiegelberg, was the first to show that the free martin was a defective male, as he found spermatic tubules in the sex gland, and, in addition, he cleared up the nature of the defective organs. Recent work is tending to explain the whole question, but in regard to this subject the two contributions of greatest value in this country in the nineteenth century were those of Hunter and Simpson, while in Germany Spiegelberg takes the lead, and in Holland a completely forgotten discoverer, Numan, who published in 1843 an atlas on this question, of the very greatest value.<sup>1</sup> Numan did not recognise that the most of the specimens he examined had really testes, but his contribution is an exceedingly able one, and so far as illustration is concerned is much better than any of the others.

In the question of hermaphroditism, Simpson's monograph published in Todd's *Encyclopædia*, an almost forgotten work now, with some exceedingly valuable articles in it by Farre, Richard Owen, and others, is still authoritative, and displays a very great amount of research. We do not as yet see at all clearly through this sexual deformity, the difficulty being that what we mean by sex is not sufficiently defined. It is the presence of an ovum or spermatozoon that alone determines sex. An individual with a sex gland containing spermatozoa is a male, despite the presence of an arrangement of its lower genital tract simulating the female lower tract. There is the very strongest probability that in mammalia a real hermaphroditism cannot exist.<sup>2</sup> The instance is brought forward sometimes of the existence of an ovotestis, but the condition is not conclusive, as probably what is described as an ovum is merely a separated and degenerated spermatic tubule with a sperm cell in it. I have seen such in the free martin, but to discuss this question in a limited space would be impossible. Simpson's work on Hermaphroditism showed him

<sup>1</sup> A clean uncut copy of Numan's atlas was acquired for the library of the Edinburgh Royal College of Physicians. Spiegelberg knew it through a translation in a Belgian journal without the plates, also in the College library. John Hunter died in 1793.

<sup>2</sup> Sir Samuel Wilks has always held the existence of a human hermaphrodite as unproved.



possessed of the very highest qualities for pure scientific research, and is still a classic.

Looking back, then, on what has been already said, it may be confidently stated that von Winckel's eulogy is well deserved and accurate, and he might indeed have extended the sphere in which he considers Simpson to have been one of the most eminent discoverers so as to include the Continent of Europe itself.

Scotland may well be proud that in it there should have been born such a man of genius, and that Scottish School and University training should have given this son of her's full scope for his development. Simpson died in his prime, full of honours if not of years, and has left behind him the reputation of one of the greatest of men. He died with his fame unsullied, worn out with strenuous unselfish work, and while the estimation he is held in in all lands is of the very highest, it may be safely predicted that as time goes on it will increase more and more to a perfect appreciation.

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## SIR JAMES Y. SIMPSON'S CONTRIBUTIONS TO ANTENATAL PATHOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.E.,

Physician to the Edinburgh Royal Maternity and Simpson Memorial Hospital; and Lecturer on Antenatal Pathology in the University of Edinburgh in 1899 and 1900, and in the Polyclinic, Medical Graduates' College, London, in 1900.

SIR JAMES Y. SIMPSON left upon the subject of antenatal pathology the impress of his strong and original mind, and in this respect it did not differ from the other subjects (such as anaesthesia, the arrest of haemorrhage, hospitalism, &c.) to which he devoted time and attention. He could study nothing in a slight fashion, for he was no dweller in dilettantedom; whatsoever his hand found to do he did it with his might, and his might was considerable. When he approached any subject of study he set forth resolutely along three lines of action and inquiry which hardly ever failed to bring him to novel and weighty conclusions: he collected facts with assiduity, and was not ashamed to go to his professional brethren for their help and advice: he read exhaustively what had been already written by others on the matter; and he then fearlessly drew his deductions and stated them with clearness and force, caring not whether they agreed with or differed from his original presuppositions. It is along such a path that the man must go whose desire is to see his work prospering long after it has left his hands, long after his hands have ceased to do any work.

Sir James Simpson's contributions to antenatal pathology were all made in the early part of his career, and, with a few inconsiderable exceptions, they were all gathered together by Priestley and Storer in the second volume of the *Obstetric Memoirs*, published in 1856, when he had still fourteen years longer of strenuous and fruitful life before him. They constitute a distinct section of that volume, appearing under the heading of "Physiology and Pathology of the Products of Conception," a phrase which finds its equivalent to-day in the shorter title, antenatal physiology and pathology. The latter, however, is a wider term, for it includes not only the health and disease of the fetus and embryo, and of their annexa (which are, of course, the products of conception), but also of the reproductive cells before they meet in the act of fertilisation. Sir James Simpson did not

indeed shut himself off from the consideration of the ante-conceptional aspect of matters, but heredity and its laws had not in his day taken on the importance or received the elaboration which they now have.

It can be easily understood that investigations into foetal diseases and monstrosities became less and less possible as Simpson's time was more and more filled with the directly practical matters arising out of his epoch-making discoveries in anaesthesia. It is doubtful whether there was any time in his life when he had "quiet doors and unmolested hours," but certainly in his later years the current of life ran rapidly and fully with him above most men and left small opportunity for any but the most pressing and vitally important questions. Yet even in these later and so fully occupied years he found time to add to his notes on such subjects as spontaneous amputations of foetal parts, and the present writer has in his possession some hundreds of pages of his MS. and some dozens of drawings (a gift from his nephew, Sir Alexander Simpson) illustrating this form of antenatal malformation which so greatly interested him.

Sir James Simpson's article on "Hermaphroditism" was prepared for Todd's *Cyclopaedia of Anatomy and Physiology* (vol. ii. pp. 684-738, 1836-39) before his appointment to the Chair of Midwifery in the University of Edinburgh, and the composition of it and the literary research preliminary to that must have both been exacting and prolonged. The result was a monograph which for completeness and insight and clearness of description far surpassed any that had previously appeared on the subject in the English language; it compared favourably with that written about the same time (1836) by the great French teratologist, Isidore Geoffroy Saint-Hilaire; and it has since served as a work of reference for numberless writers, who have drawn freely upon its facts and conclusions. Of course, embryology had not reached the stage of development in 1836 that it has now, and many matters concerned with the appearance, homologies, and analogies of the genital organs were but inaccurately ascertained. Still, Simpson recognised clearly that it was along embryological lines that inquiry must advance, and that it was in arrested development of the sexual organs that an explanation was to be sought of many of the varieties of spurious hermaphroditism. Further, he did something to bring the subject of hermaphroditism out of the position of artificial isolation into which previous writers had inclined to place it when he stated the belief that a key to the

understanding of the early morbid conditions of the reproductive organs would be found in the study of the causes which produced malformations in other parts of the body. He missed, however, the true reading of the facts in the curious case of the free martin, but he did what was perhaps more serviceable at the time, he disabused people's minds of the prejudice that in the human subject females born co-twin with males were sterile. He gathered together information regarding forty-two adult married females who had been born as twins with males, and showed that thirty-six of them were mothers of families, whilst six only had no children—not a high degree of reproductive inadequacy. Further, he recorded the interesting fact that two of the females who had families were each born as a triplet with two males. Sir James Simpson thus once and for all disproved the assertion that women born co-twin with males were free martins and sterile, and whenever this belief has again come to the front (as it has done periodically) it has always been sufficient to refer the anxious inquirer to Simpson's convincing statistics for ease of mind. Had Simpson known that the free martin calf was in many cases a malformed bull he would have been able to bring forward another reason why the aspersion of sterility should not rest upon the female of twins in the human species.

Of late years there has been a great development of our knowledge regarding the psychology of the pseudo-hermaphrodite, and on a somewhat uncertain foundation a whole superstructure of theories regarding the origin of the sexual feelings and the existence of mental hermaphroditism and of moral perversion has been built up. There is nothing of this in the work of Simpson.

Another department of antenatal pathology upon which Sir James's work threw considerable light was that of the production of *spontaneous or intra-uterine amputations of limbs*, and of the reproduction of lost parts. He was not the first to suggest that the umbilical cord, in the form of a constricting coil, was the amputating agent—to Barzellotti (in 1827) that suggestion seems to have been traced—but he did much, with the evidence he was able to collect, to establish the teratogenic powers of the funis, and to place it alongside of the bands of organised lymph of Montgomery as causes of congenital amputations. So strong was the evidence accumulated by Simpson that recent teratologists, whilst expressing great scepticism regarding the power of the umbilical cord to cut through the tissues of a limb, have found much difficulty in explaining away the observations which



had been recorded. Out of the work which Simpson did on spontaneous amputations arose his fascinating hypothesis that the rudimentary digits seen sometimes on the stump were an attempt towards the reproduction of the lost part. This, also, has been criticised, but although seventy years have passed since the suggestion was advanced, it cannot be said to have been disproved, and, of late, experimental teratogenesis has done something to show that the power of reproducing lost parts, even in the higher animals, may be greater than has been supposed. At any rate, Sir James Simpson seems clearly to have grasped the great thought that in antenatal life there exist powers which are not seen in action in adult existence, at least he believed that the absence of any attempt at reproduction of digits in an amputated stump in an adult was not sufficient evidence against such regeneration taking place before birth "in early foetal or embryonic life." The matter deserves far more attention than it has yet received; and the chapter of thirty-six pages in the first volume of Schwälbe's *Morphologie der Missbildungen* is a proof that the importance of regeneration of lost parts in teratogenesis is beginning to be recognised.

Simpson's articles on "Foetal Peritonitis" and on the "Influence of Inflammation as an Antenatal Cause of Malformations and Monstrosities" contain, as usual, much careful clinical investigation and much shrewd reasoning thereupon. The following passage shows that he saw far into the later developments of the science of teratology:—"The happy idea that was first suggested by the master mind of Harvey, relative to certain malformations consisting, *not* in the *substitution* of an entirely new and anomalous type of structure in the malformed part, but only in the simple *permanence* of some of its transitory foetal types, has been reduced within the last thirty years, by the able investigations and labours of Wolff, Autenreith, Meckel, Saint-Hilaire, and others, into one of the most certain and comprehensive and at the same time one of the most beautiful laws in teratological anatomy." It was unfortunate that at this stage Simpson failed to distinguish between the morbid processes of foetal and those of embryonic life, and that he tried to take changes peculiar to the formed tissues and organs of the foetus and apply them in the explanation of the origin of mal-developments of the forming parts of the embryo. At the same time the rest of his reasoning was sound enough and his outlook was far-sighted when he wrote: "For our own part we entertain little doubt that physiologists will ere long be enabled to proceed

with confidence one step further in investigating and generalising the causes of the production of some of those malformations that are at present attributed, in accordance with the above principle, to deficient or arrested development merely, inasmuch as they will feel themselves entitled to trace, in a certain number of cases at least, the state itself of impeded development to the anterior influence of different inflammatory and other casual pathological conditions of the early embryo." There is now a strong belief that the diseases of the *fœtus* are one thing and the malformations of the embryo another thing, and that to attempt to explain the latter by the former is to put the cart before the horse. There is a feasible theory which regards deviations in development and arrests of ontogenesis in the embryo as themselves the results of the action of the morbid agent, just as inflammatory and other changes are the result of its action upon the more developed tissues of the *fœtus*. According to this view the origin of the malformations is anterior to that of the *fœtal* diseases, such as inflammation, and it must be admitted that this is much more likely than the hypothesis advanced by Simpson. The co-existence of the signs of peritonitis and of various malformations in the infant at birth as an occasional occurrence is undoubted, but it is nowadays regarded as due rather to the fact that a common morbid cause, *e.g.* the syphilitic poison, has acted upon both the embryo and the *fœtus* than to the inflammatory process having arrested the development of the embryonic tissues. Simpson's contribution to the subject of *fœtal* peritonitis was admirable, but his attempt to make large generalisations from it in teratology was handicapped by incomplete knowledge of the essential differences between the conditions of *fœtal* as compared with embryonic existence.

His article on "*Ichthyosis Intra-Uterina*" was a model of what such a contribution should be—clear, concise, complete. Two original cases of a very rare disease were described and figured; similar cases previously reported by other observers, French, German, and Dutch, were summarised and compared; the nature of the morbid condition was considered; and the reasons were given for regarding it as the intra-uterine form of ichthyosis. Further cases of the malady have been described since Simpson read his communications (1843, 1844), but little has been added to our understanding of its nature, and it still retains the name then given to it.

It is difficult to pronounce an opinion upon Simpson's early contribution on "Congestion and Inflammation of the Placenta." It was the dissertation which he read before the Royal Medical Society when he was twenty-four years of age (1835), and probably few obstetricians would now endorse all that was said therein regarding placentitis and its effects. At the same time it opened up new ground and suggested lines of inquiry into the problems of antenatal diagnosis and treatment which were yet to be avenues of advance in knowledge. Specially important were Simpson's speculations concerning the effects of placentitis upon the foetus. In the paragraphs dealing with that subject it was clearly shown that he had grasped the idea of the paramount importance of the placenta as an organ of the foetus and the consequent extraordinary danger to the unborn infant which arose whenever the placental tissues became the seat of pathological change. The whole subject evidently remained in Simpson's mind and formed the matter of thought and experiment, for, some ten years later, he was able to deal therewith in a more magistral fashion, and even to report successful treatment based upon the principles he had evolved. Recognising the importance of placental changes as causes of foetal death, and observing that some women repeatedly gave birth to premature dead infants, Simpson resolved to try to treat medicinally not the unborn infant but its placenta. Starting with the assumption that an imperfect placenta was equivalent to imperfect lungs, he resolved to endeavour to make the mother's blood so full of oxygen that the small part of placenta which remained capable of healthy functioning would suffice, by means of the highly oxygenated character of the blood circulating in it, to keep the foetus in life until it was of an age when it might be withdrawn from the uterine interior into the outer world, where, of course, the special intra-uterine and placental dangers would no longer pursue it.

Whether or not we believe that he succeeded in doing this by means of chlorate of potash, or whether we regard the good effect which often followed as due to another kind of action of the chlorate or no, there remains no doubt that a beginning was here made with a rational form of antenatal therapeutics, the full significance of which has hardly yet been noted. A sentence from Simpson's work was the starting-point for an experiment in antenatal therapeutics which I have now made in several cases. He wrote: "Would the use of chalybeates, or other means, ever so invigorate the child as to prevent those placental diseases—such as

fatty degeneration—which may possibly be connected with want of power in the fetal economy and circulation?” I believe good has followed the continued administration of iron and chloride of calcium to pregnant women who had lost all their previous infants through antenatal death, and I had occasion to point out to the post-graduate students attending my clinics at the Royal Maternity and Simpson Memorial Hospital last autumn a case undergoing treatment of this kind. The mother was successfully delivered of her first living infant during the month of October. It is true that antenatal therapeutics has made no very wonderful advances since Simpson’s time, but for that he cannot be made to bear the blame. He did his best to open up a path for future explorers, he collected data and he made experiment, and he left the matter with the statement, “it is quite open for inquiry.”

It is remarkable that even in some of Sir James Simpson’s short notes on specimens shown at meetings of the Edinburgh Obstetrical Society and elsewhere one comes across fragments of thought of very considerable value, and I may fittingly bring this appreciation to an end by quoting what he said about a specimen of “hydatid ovum” in 1847: “The alleged hydatids were, no doubt, merely the enlarged villi of the chorion. So far, the affection was a kind of *malformation* from arrest of development, the villi of the chorion remaining of their early embryonic type, and continuing to increase and grow under this retained type of structure, but the cells of the villi, constituting the hydatid placenta, appeared at the same time to be generally broken up in their internal tissues, and distended by a morbid accumulation of fluid, so that we have *disease* added to malformation, and dropsy co-existing with the hypertrophied state of these structures. It would be difficult to decide whether the dropsy stood in the relation of cause or effect to the malformation, or whether both were not the effects of some common cause.” The most modern views on hydatidiform degeneration of the chorion and the syncytial covering of the villi stand at no great distance from the opinion thus laid down by Simpson incidentally when showing a specimen at a meeting of the Society whose President he was from 1841 to 1858.

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## LIFE AND ITS EPIPHANIES.

THE ADDRESS TO THE HARVEIAN SOCIETY OF EDINBURGH

By Emeritus-Professor SIR ALEXANDER RUSSELL SIMPSON.

M.D., D.Sc., LL.D., President of the Society for 1911.

GENTLEMEN—FELLOW-HARVEIANS,—The man, the spell of whose genius and character and toil gathers us in festive commemoration of his birth three hundred and thirty-three years ago—Dr. William Harvey—was profoundly interested in Life, its source, and its course. We, who are proud to be members of his profession, share this interest. It could not be otherwise with those who are set in their communities to act as watchmen at the gates of life, who are called to attend when a new life comes to seek a line in a people's census, and again when a certificate is required to tell the registrar how the life has passed away. It will always become Harveians to consider Life and its Epiphanies.

## “BETWIXT THE VISIBLE AND THE INVISIBLE.”

It is not in his greatest and best-known work—*On the Motion of the Heart and Blood*—that we find Harvey's fullest thought on Life. Yet in it already he lets us see him exercising his clear vision and his far-seeing imagination on “a bloody point so small that it disappeared during the contraction and escaped the sight, but in the relaxation it reappeared again, red and like the point of a pin: so that betwixt the visible and the invisible, betwixt being and not-being, as it were, it gave by its pulses a kind of representation of the commencement of life” (Sydenham Society edition of his works, p. 30). We like to find the man to whom it was given to discover and demonstrate the action and use of the heart, giving in all his writings a regal place in the economy to what he has taught us to regard as its central organ. He speaks of it as “the beginning of life; the sun of the microcosm, even as the sun in his turn might well be designated the heart of the world” (p. 47). Again, “the heart, like the prince in a kingdom, in whose hands lie the chief and highest authority, rules over all: it is the original and foundation from which all power is derived, on which all power depends in the animal body” (p. 83). In his first chapter he says: “When I first gave my mind to vivisections

as a means of discovering the motions and uses of the heart, and sought to discover these from actual inspection, and not from the writings of others, I found the task so truly arduous, so full of difficulties, that I was almost tempted to think with Fracastorius, that the motion of the heart was only to be comprehended by God" (p. 19). When, after his much reading and reflection and long research, the beautiful truth became clear to him that the blood is driven in a circle through the body, he lets us see that "the household divinity," as he calls the heart, is not self-produced or there by chance, for in the last chapter of his famous treatise he bids us note that "Nature, ever perfect and divine, doing nothing in vain, has neither given a heart where it was not required, nor produced it before its office had become necessary; but by the same stages in the development of every animal, passing through the constitutions of all, as I may say (ovum, worm, foetus), it acquires perfection in each" (p. 82). He was an Evolutionary before Darwin.

#### "THE DIVINE ARCHITECT."

It is in his less read work on animal Generation that we come more closely on his thoughts on the problems of existence. Each Harveian, as he comes on these thoughts of the Master, recognises that they are the expressions of one of the sanest of minds. He will have nothing to do with the way of "the vulgar and unlettered," who, "when they do not comprehend the causes of various effects, refer them to the immediate interposition of the Deity" (Letter to Riolanus, 120). No more will he be associated with philosophers who teach that "all things may be produced from nothing" (p. 32); or again, who "assign a material cause for generation, and deduce the causes of natural things either from the elements concurring spontaneously or accidentally, or from atoms variously arranged. They do not attain," he goes on to say, "to that which is first in the operations of Nature and in the generation and nutrition of animals, viz. they do not recognise that efficient cause and divinity of Nature which works at all times with consummate art, and providence, and wisdom, and ever for a certain purpose and to some good end; they derogate from the honour of the Divine Architect, who has not contrived the shell for the defence of the egg with less of skill and foresight than He has composed all the other parts of the egg of the same matter, and produced it under the influence of the same formative faculty" (p. 207).

ENLARGING VISION.

The race has travelled far since Harvey's day. Means and methods of research unknown then are at our disposal now. The range of vision, alike towards the infinitely large and infinitely little, has gone on extending. The lessons of sense have not been lost on the self-conscious inquiring mind which has ever to adjust itself to the new unfoldings of its environment. In every new page of human history, the Harveys—the men of broad mind and attentive vision—still find themselves intelligent units in a universe which is to them a Poem, and the Poet is God. A Harveian of the twentieth century, when he comes to search into the questions of the What, Whence, and Whither of Life, may seem to belong to a different country from the Master, and to speak a foreign tongue. His lexicon has in its columns words coined since Harvey's day, because the Supreme Poet is still at work, and in each new generation is making fresh unveilings before eyes that look to see. As he turns aside to-day to see Life in its earliest epiphany he pictures it, not in the first blood-drop that catches the eye in the incubating "colliquament" of an egg, but in a microscopic speck of jelly-like matter that he calls "protoplasm." This protoplasm he can resolve into its elements in his laboratory, but he cannot build them together again into a thing that is zoic and zoögenic. Carbon, Hydrogen, Nitrogen, Oxygen, Sulphur, and whatever other less constant element may be taken up in the material build of the living thing, were in the planet long before Life laid hold of them for its service, and they are still there when Life has laid them aside. We never see Life dissociated from matter, yet we can see with Bergson (*Evolution Creatrice*, p. 267) that whilst matter is something sinking on a downward slope towards static rest or decay, Life, using matter and contending with it as it were, is ever moving up the slope towards new achievement.

LIFE THE CAUSE, NOT THE CONSEQUENCE, OF ORGANISATION.

Naturalists know that there can be life apart from organised material. "Whatever life is," says John Hunter (*Essays and Observations*, 1861, i. 114, 115), "it certainly does not depend upon structure or organisation." "Organisation is not essential to life." And again, "The living Principle appears to be the same in all animals" ("in essence, not in degree," notes his wise editor, Richard Owen). Huxley tells us (*Introduction to Classification of Animals*, 1869, 10)

that Rhizopoda illustrate "a very well-founded doctrine, and one which was often advocated by John Hunter, that life is the cause, and not the consequence, of organisation; for in these lowest forms of animal life there is absolutely nothing worthy of the name of organisation to be discovered by the microscopist." The Harveian, then, who puts himself under the guidance of the modern representatives of the magisterial minds whom Dante groups round Aristotle—"the master of them that know"—and I like to remember that one-fourth of the names he celebrates belonged to our profession—the Harveian who finds time to attend a little to the teaching of the modern leaders in astronomy, physics, chemistry, geology, biology, learns that before life has taken on or been taken on by matter there is evidence of the existence and activity of a Living One which it would be perversity to ignore. The learner has his place to-day on a planet which is small among the stars and suns that roll through the immensity of space, and which took beginning long after some of them. As in many of them still, he sees that there were dateless periods far anterior to any epiphany of life on earth, when the possibilities of the existence of a living thing was not as yet evolved. They were not times of Chaos, these leisurely revolving epochs. As stage after stage is built up of the theatre on which the great drama of life could be unfolded, let the Harveian, like Harvey himself, but keep all that is within him free to look fairly and to think fearlessly, and he cannot fail to see the directive working out of a purpose by a Being majestic in truth, in wisdom, and in power. If I heard in my drawing-room thrilling notes of music and a voice calling me to—

"Worship the King all-glorious above,  
O gratefully sing His power and His love,"

and I went expecting to join my daughter in her song, it would greatly perplex me to see no player, no singer, there. But I could not conceive that the movements of the keyboard went on spontaneously, and that the words sounded themselves without vocal cords in the empty air. I would rather believe that she had found and put on the fabled ring (Rev. Dr. Joseph Cook's *Boston Lectures*) of the King of Lydia of old which made its wearer invisible. Or if at another time the strains had been more mechanical, and I came and saw the pedals of the pianola apparently moving of themselves, I would conclude that she had passed on the Gyges ring to her brother.



## INTELLECTUAL CINEMATOGRAPH OF CREATION.

Now the twentieth-century Harveian, who during his medical curriculum has to learn something of the rudiments of various ancillary sciences, does not need to make wide excursions through their various fields till he is made aware that they all lead on to a glowing globe of fiery mist as the earliest conception to be gained of our material planet. Under the guidance of the seers of science he watches the cooling, and consolidation, and contraction and contortion on the surface of the mass amid the play of the æonic inherent forces, till after long ages and through many transformations there is evolved the as yet inorganic Earth with its vicissitudes of land and sea and air and cloud that have made it possible for it to become the habitat of Life. It is easier for him to-day than it was for the last century Harveian to trace back step by step the purposive processes of the Eternal Spirit, of whom, and through whom, and to whom are all things.

## TRANSFORMATION OF METALS.

As I passed along one of the paths in the Grange Cemetery the other day a name on a modest tombstone caught my eye and recalled the memory of the gentle pensive face of a man I once saw in my uncle's house about sixty years ago. I was then attending the chemistry class and was being taught the then current views of the immutability of the elements, and as Sir James and his friend had been having a lively discussion on some chemical subject, I asked his assistant who the visitor had been. He said, "Oh, that's a dreamy kind of chap who thinks that all the different elements are just different forms of one and the same thing—lead and silver and gold all coming from some more primitive element. The other fellows laugh at him. But after all," added Dr. Drummond, "for aught I know, he may be right." Dr. Samuel Brown is being vindicated to-day by the chemists who speak of the "Ancestry of radium" ("The Evolution of Matter," by W. C. D. Whetham, F.R.S., in *Darwin and Modern Science*), and who, "on the hypothesis of direct parentage," can give the "pedigree of radio-active change shown by one family of elements"—Uranium, through Radium, &c., on to Lead. The physicist, on his part, recognises that the atom is a "manufactured article," and searching back and back through matter toward the intangible invisible ether, of which he has become positively aware, he comes to something that he likens to a vapour whorl or a knot on a

thread of electricity. Surely to the Harveian now the veil between the seen and the unseen is becoming translucent. The rents in the septum between the material and immaterial are becoming so many and so wide as to make it natural to expect that "spirit with spirit can meet."

#### JOHN GOODSIR'S "THOUGHT OF CREATION."

All this makes it easier for John Goodsir's students to appreciate the lessons he taught them when, *eff.*, he said: "We cannot think of a thing but as an existence. We cannot think of a thing except under the condition of Time, *i.e.* we are under the necessity of considering it only as a new form of what existed before it. Therefore we cannot think of it as absolutely commencing *per se*. We are able to conceive the creation of a world—this, indeed, as easily as the creation of an atom. But what is our thought of creation? It is not a thought of the mere springing of nothing into something. On the contrary, creation is conceived, and is by us conceivable, only as the Evolution of existence from possibility into actuality by the fiat of the Deity."

#### FIRST EPIPHANY OF LIFE.

If, so far, the Harveian has been reading the great poem of the Universe, he has learned how the theatre was built on which preparation was made for the development of activities more wonderful than any that could be weighed in the balances of the physicist or subjected to the analysis of the chemist. The wonderfulness of these activities and of this new phenomenon among our planetary phenomena lies in this, that whereas heretofore the Unseen has thrown out from Himself the uninhabitable globe of matter and guided it in its evolution to become a habitable globe. He now in the fulness of time begins to take matter into closer relation with Himself by imparting to it something of His livingness. As in His other ways, in this also He comes without observation. Had there been a Harveian present when life first entered on the scene he might have found it difficult to see how the 2000 to 30,000 (2703 of Zinoffsky; 30,000 of Bate-Hardy; cf. *World of Life*, pp. 293, 355) atoms in a proteid molecule, which life was to clothe itself with and then lay aside for the chemist's analysis, were fashioned into the protoplasmic vesture. What he could see was something that was not an element among the pre-

existing elements, nor a force among the already operative forces. It could dwell in and be indwelt by the archaic elements: it could modulate and be moulded by the æonic forces: it could only be known by its influence on the elements it was laying hold of and being laid hold by for a time on its onward way. No rock could add to its bulk, no wave could move except in the direction it was driven. The object that has life, the *zoön*, was seen to grow by taking to itself and transforming from within what material it required: it could contend with the gravitation that kept the stars in their places. "We know to-day," said Virchow in 1849, "whence the wind comes and whither it goes, but we know not whence the general stream of life comes and whither it goes. The wind rises and goes to rest: a new wind springs up and passes by, but it is always the same air which streams now this way and now that. It is not so with Life. Nowhere do we see spontaneity, nowhere life originating in local conditions. A long chain of movement-epiphanies passes before our senses without interruption, without real rest, but it is not the same substance through which this endless movement runs. One part after another dies off and passes out of the current, and new particles from the air, the water, the soil are drawn into the great whirl. From the moment when, at the time of the anthropogenous revolution of the earth the general movement took on in part the impulse of life, we have a wave without an ending." This is from that essay in which Virchow (*Gesammelte Abhandlungen*, p. 39), advancing on Harvey's position, formulated the doctrine *omnis cellula e cellula*. If Weismann carry the modern still further and bid him see the endless wave of life passed on from germ plasm to germ plasm within the cell or its nucleus, it still remains easiest to watch life declaring itself as it makes its way onward and upward from cell to cell until it reaches the far-off height of its evolutionary display in the creature *Homo Sapiens*, who can think of it, and speak of it, and apprehend what yet he may not fully comprehend.

#### ELUSIVENESS OF LIFE.

At any stage the observer can only trace the activities of life. If through any experiment he tries to lay hold of it, before he knows he has killed it. It is like Socrates when, the hour for his hemlock draught being at hand, Crito asked him, "How shall we bury you?" and Socrates answered, "As you please: only you

must catch me first, and not let me escape you. . . . You must be of good cheer and say that you are burying my body; and you must bury it as you please, and as you think right" (*Phædo*, lxiv.). Or it is like that brittle star-fish of which Edward Forbes told his students, which was furnished with an eye at the end of each ray. He and others were eager to catch one entire in their dredging operations. They thought they were at last succeeding in their quest when they saw among the contents that came to the surface of the water a lovely *Luidia*. But the moment a ray was touched it detached itself from the rest and slid back into the sea. As they held the net hesitating how to secure the creature, they saw limb after limb break off and fall away, till there was only one arm left attached to the body, which now slipped through the meshes, and as it was sinking out of sight the eye at the end of the ray closed with something, Forbes said, "like a wink of derision." Or, again, let me remind you that Harvey knew his Virgil, and quotes with satisfaction the lesson that Anchises taught the pious son who came to visit him among the shades (282)—

"'Tis innate soul sustains: and mind infused  
Through every part, that actuates the mass."

I recall this here to suggest that the Harveian seeking to grasp the secret of life is like Æneas when he wished to embrace his ghostly father. "Thrice he tried to throw his arms around his neck and thrice the figure escaped the vainly grasping hands, as if it had been soft air and very like a fleeting dream."

#### CHARACTERISTICS OF LIFE.

If ever a member of our fraternity is to see anything of the meaning of the primordial living object, he must carry with him some clear consciousness of that in himself towards which life was coming through the long succession of the zoic ages of the planet ere it gathered him up in its onward sweep. He has to put himself into it and bethink him what inheritance it will begin to pass on to him. Trying to mark it off from non-living things by its characteristics (for which see "Biology" in Hastings's *Dictionary of Ethics*) he will note among others these two qualities pre-eminent among those that differentiate it from all inorganic things—(1) it has the power to grow; (2) it has the power to multiply. In its constant conflict with its material environment it lays hold of what it needs to sustain its existence and promote its working



power. Let it go on to assimilate beyond these necessities and there is before it the danger of death or degeneration. A nobler fate will befall it if, instead of playing the egoist, it takes the altruistic alternative of surrendering its own individuality and giving place to two successors. For there in its earliest epiphany Life is seen bearing a burden of service and showing a trace of the red streak of sacrifice that accompanies it along all its way. It is so vain to explain what is to be seen of life on the principles of mechanism and geometry that Professor Haeckel, the very Coryphaeus of materialism, puts immaterial soul in the first microscopic progenitor of all that lives, from which man himself has sprung and to which his embryogeny bears witness, in accordance with the Haeckelian law that each individual recapitulates the story of his genealogy during his evolution from ovum to infant—"ovum, worm, foetus," as Harvey has it. The zoön, with its sphere of operation among material things, is subject to all the laws that reign in the realms of matter. By virtue of that which is not material in it, it brings into view laws that reign in the realms of life. One of the most impressive of these marks the diversity that arises from the unity of life. The zoologist, who does not let the mind rest at any backward-tracing point in the evolutionary programme of creation till he arrives at his and our primordial protoplasmic speck of an ancestor, comes in sight of one endowed with a power that as it multiplies produces a divergent progeny.

#### DIVERGENT LINES OF LIFE.

Along one line the cells clothe themselves with a covering of cellulose that stiffens them. Some degree of the inertness of the material in their origin asserts itself in their progress. They become stationary; they grow by assimilation of matter from the soil into which they have fallen, and of the air and light that plays upon them where they rest and root themselves. These are the progenitors of the vast and varied products of the vegetable world. They, in a measure, come to their own at an earlier date in the cosmic story; at least we have their relics in the strata which have failed to hold the traces of the earliest forms of animal life. For these other offshoots from the common progenitor have retained their freedom. Their loose outer covering allows them to move about in every direction in quest of their requirements. At times they find what they want in some fragment that a plant has no longer use for, but that has become more easily assimilable through

the change in its elements the plant life had brought about. It may be that the cells that are moving towards animality, even at that early stage, may take into their substance smaller cells still instinct with vegetable life, as will be seen to be the rule between their respective descendants when the laws of life are broadening their scope. Yet the memory, shall we call it? in the vegetable progeny, of the possibility of development towards the animal line of life is never so utterly lost but that some among them live a motile life, and others, not content with drawing sustenance from the inorganic world, become parasitic on other plants, or even have been led to the assimilation of animal nutriment. Likewise along the animal line we come on some who have surrendered the motility that is the common characteristic of their kingdom to become stationary, and perhaps show that their chief function in the scheme of life is the vegetable one of serving as aliment for others that have passed them in the race.

#### THE PROCESSION OF LIFE.

To get an impression of the grandeur of the procession of Life on its way through paleozoic, mesozoic and kainozoic ages and their subdivisions, one has to put oneself under the guidance of a great leader in science like Alfred Russell Wallace in his *World of Life*, or of the hereditarily mystic member of our profession, Dr. Greville Macdonald, who applies his scientific knowledge to an inspiring study of *The Child's Inheritance*. It were too long, and it is needless in a Harveian company, to attempt even a summary of the bioscopic panorama, but let us note some things about Life as it unfolds itself to our vision. It retains something of identity, of oneness, amid endless variety of expression. Ungainly of form, or invested with beauty, it remains ever distinct from all its environment. It holds true to its own characteristics: it keeps up a solidarity through all its domains.

#### INSTINCT AND INTELLIGENCE.

As it takes a new direction it seems to carry with it the possibility that it might have taken another course. Along one line of progress the psychic in it will emerge in forms where instinct rules the activities. Even then, however, there are manifestations of the intelligence that was involved equally with instinct in the common ancestor, whence came also the line along which intelligence grew from more to more. And here, again, what instinct contributes to

the zoic development was not so completely laid aside but that its influence can be clearly discerned where intelligence has reached its highest. Indeed intelligence cannot come to itself without the adjutancy of instinct.

#### PROGRESS IN A SPIRAL.

Further, on the cover of Goodsir's *Contributions* he used to print a spiral. His genius saw, and made his pupils see, a law of spirality pervading all organic growth, whether in the animal or vegetable world. According to this the procession of life moves onward in a course that cannot be represented either as a straight line or as a circle that returns upon itself. The spiral may end in a point that represents the last product of an order or a genus, and if we think of that spiral throwing off buds of a new species from its concavity, the likelihood is that all this inner progeny will share the fate of the progenitor and be found among the forms that creative evolution has laid aside among the testimonial treasures of the rocks. The line of larger and onward development is to be sought among the outgrowths from the spiral's convexity, with its wide outlook and unconfined possibilities. The "go" of life, the *elan vital* as Bergson has it, carries it up and up this spiral staircase, and us with it, until we find ourselves on the broad field on which we are called to play our human part.

#### THE UNIVERSE A HARMONY.

Up till this stage has been reached there has been no note of discord through all the ages and the spaces. If in our planet there were times of formlessness and emptiness, yet the sounds that issue from the deep are all harmonious. If there seem to be broken lines or absent pages in the poem of the universe these also will be all filled in when the race that is still at school has better learned to spell it out and read it. It might be expected that the harmony would be most complete when among the other forms of life this new epiphany arose, for which it seemed as if all the rest had been a preparation. All the physical conditions now present in this planet, and all the varieties of life, animal and vegetable alike, had come to such a stage in their evolution that they could be subservient to the uses of a creature that should dominate the rest. Without looking at the manifold provisions of the vegetable world, when

we consider how many animals were awaiting his arrival ready prepared for his domesticating powers, like the foxy five-toed eolippus of the early tertiaries that grew through the miohippus and other stages of evolution on to the solidungulate that could go with man in his trudge to the South Pole or gallop him on the sands of Arabia, it makes us, to compare great things with small, look on evolution as an expectant mother making long provision for the advent of her unborn babe. Yet small as is this babe, the last product of the long evolutionary processes, he is greater than all preceding products—yes, and greater than all the processes that have led up to him, for Life, in the epiphany that arises in this new creature, puts on qualities hitherto unexpressed.

#### A NEW EPIPHANY OF LIFE.

He has come, if you like, without a break from the earliest monad, though in following his track you may find as long intervals as lengths of link in the chain. He may have come by the way of germ plasm transmitting to germ plasm the power to grow around itself the varying form of body that differentiates kind from kind, and that serves in each as guardian for the life-propagating cells. This somatic "excrecence," as it has been called, has gradually developed in it, through nerve and ganglion and brain, the structures that are the seat of sense and instinct and intelligence. Until now it has fulfilled its function faultlessly, irresponsibly obedient to internal impulse and outward influence. In man the guardian soma attains the dignity of a trustee. "That peculiar principle," says John Goodsir (*Anatomical Memoirs*, i. 316), "in the constitution of man, which acts independently of his instincts, and in virtue of which he is conscious of self, capable of apprehending the objects around him as external to self, enabled to exert his corporeal and physical powers in the accumulation and co-ordination of ideas and their origin; but, above all, capable of determining between right and wrong; of recognising his own immortality; and his dependence, as well as the dependence of all around him, on his and their Divine Creator, is an intelligence altogether different in kind from the instinctively co-ordinated intelligence of the brute."

Man is conscious of himself; he can recognise and name his fellow-creatures, whom he sees without self-consciousness obedient



to the laws and rules of their regulating instinct or their modicum of intelligence. He is conscious of free will, and may follow the dictates of his self-conscious regulating principle or may act contrary to them. He can not only know and think and utter his thought, he can manufacture. So that Bergson suggests he should be labelled *Homo faber* rather than *Homo sapiens*. He can know, and knows that knowledge is not an end. He can think, and that with the view to make knowledge and thought the guides to action, as we are learning from the pragmatism that has come to take an effective place among the thoughtfulnesses of philosophy. For the Pragmatist recognises that thought is meant to be exercised not as an end in itself, but to have an outcome in activity serviceable to the thinker or his neighbour.

#### THE UNIVERSAL HARMONY DISTURBED.

The sorrow of the world comes in just here, that the creature into whom the Eternal Spirit had put that something of His spirituality that distinguishes him from other zoa—as He had put into the primal organism that something of His livingness that differentiates it from inert matter—the creature who might have been expected to give voice to all the harmonies strikes a note of discord that vibrates through the ages. Consciously free to set his will either in subjection or in opposition to the will of the Supreme, he chooses to play the rebel part. It is an honest confession that comes in Ovid's wail from the heart of humanity—"I see the better and approve it. I follow the worse."

#### LIFE MISSING ITS AIM.

This is not the occasion to trace the generational procession downward from primitive innocence and harmony, in the conflict in man between the better and the worse—in individuals, in families, in races. Throughout it can be seen that the Creator never forsakes (as in our anthropomorphic phrase we put it) the work of His own hands. Ever from time to time, on the downward slope, from monotheism towards polytheism and pantheism and animism and the various cults and cultures with which men content their conscience, one and another has been found who could keep his spirit freer than his fellows to welcome and to obey the intuitions that come to all from the Father of our spirits. These are they who have expended their share of Life to bear burdens and make sacrifices for the good of their neigh-

hours, because they have set themselves to know and to do the will of the Supreme. Like good physicians, they do not ignore the unhealthy condition of the race. They recognise that "the whole head is sick, and the whole heart faint." There is something wrong both with intellect and intuition (emotion). The prophet whose diagnosis I have quoted is even more precise, and says that he and his people are all the subjects of a malady accounted hereditary, contagious and incurable, and that was benumbing, disfiguring, destructive and deadly. "I am a leper," Isaiah said, when he saw the pre-incarnation glory of Jesus (John, xii. 41); "Woe is me! for I am a leper, and I dwell among a leprous people." Those who knew the malady knew where to turn for the cure. This sin, that has come by permission of the Creator but is no part of His handiwork, and that may be set down, like the mathematician's unknown  $x$ , as a privative—God's prophets saw it giving darkness for light, falsehood for truth, hate for love, and death for life; and they looked to Him for a new creation in which, at last, it may be nothing but a memory.

#### THE LATEST AND GREATEST OF LIFE'S EPIPHANIES.

They did not look in vain. That sin might be put away, Life had to put on a new Epiphany. The Living One had to come into living union with the race. And He came. He, apart from whom nothing came into existence that exists, became flesh, and pitched His tent beside ours. He did not abhor the Virgin's womb. Ten lunar months was the term, as Harvey in his reverent fashion states it, "which we believe was kept in the womb of His mother by our Saviour Christ, of men the most perfect." The first question we hear Him ask, and He is asking it of us to-day, is, "Wist ye not that I must be about my Father's business?" That business was not to make men religious. Religion had been built into the constitution of primeval man made after the image of God. Christ came that we might have Life, and might have it more abundantly. Let a Harveian put himself in the company of the clear-sighted young fisherman who followed Jesus when his teacher said, "Behold the Lamb of God which taketh away the sin of the world;" let him hearken to John Ben-Zebedee saying to us moderns what he wrote to the first-century disciples, "The Life was manifested, and we have seen it, and bear witness, and shew unto you that Eternal Life which was with the Father, and was manifested unto us," and he will find himself entering also into fellowship with the Father and with His Son, Jesus

Christ. He will find himself brought into harmony with the Will that wills our peace and makes all things work in harmony for our good. He will learn something of "the power of an endless life"—the dynamic of an akatalytic (indissoluble) life. If he make experiment for himself, as becomes a man of science, he will come to agree with a Scotsman of Johannine spirit who has said: "The Theanthropos is the centre of all things—the centre of the Trinity, the central figure in history, the centre towards which the heart of man gravitates, and in the heart of man its centre" (Knight's *Colloquia Peripatetica* of Professor John Duncan, 110.)

### TRUTH OR LIE?

The story of that Son of Man from whose arrival on the planet we date our centuries, before and after, may be dealt with after another fashion. Some exercise their intellect in emptying Him and His history of the Life that to others is the light of life. Let their spokesman be a clerical novelist (Gustav Frenssen, *Hilgenlei*, 585). "Human He was. Proof enough of that! First: He said so Himself. Second; in His thinking He was a child of His time. Third; He was a peculiar epiphany of character (eine besondere Charactererscheinung). Fourth: He had a development. Fifth; His nature was not free from evil. Sixth: He went wrong, especially in His beautiful warm Child-belief; He did not come back, and the Kingdom of God also did not come. . . . He was a human being, nothing more." Any man is free to talk thus, if it pleases him. He may go further and say, "There was no Jesus Christ at all; the whole old story of The Good News is nothing but a myth." It is easy to deny, very easy and very cheap—for the present. But they who use their time on earth to empty Christ of His Godhood, and who will not come to Him for a part in the akatalytic life He brought, and laid down and took up again that He might share it with the race as the Head of the new creation—these brave collectors of negations, to what shall I liken them? They look to me like mariners setting out to sail the "unplumbed, salt, estranging sea" in a vessel charged as to her tanks not with fresh water but with wine that "is a mocker," and plentifully provisioned—with empty egg-shells.

### HARVEY'S CREED.

Dr. William Harvey did not take ship with these. He was the eldest son in a family that was reverent enough to write on the

tombstone of the wife and mother that she was "A Godly harmless woman. . . . Beloved of her neighbours, Elected of God." There are many sentences such as I have quoted scattered throughout his writings referring to "the Omnipotent Creator whom it has pleased out of the smallest beginnings to exhibit some of His greatest works" (320). And he made his will "In the name of the Almighty and Eternal God," and says, "Imprimis I doe most humbly render my soule to Him that gave it and to my blessed Lord and Saviour Christ Jesus." Such an exordium may have been customary in the wills of his time. I do not know. Still, it was a man who thought out things sanely and purposefully who drew up that will, when the passing of his seventy-fourth year and recurring attacks of gout gave warning that his span of life was shortening. When his last year was more than half gone, and he felt that it was time more definitely to reef his sail and take in his oars, he read the will over again, and with his own hand added a codicil making, among other changes, kindly additional provision for his servant Alice Garth, "for her diligence about me in my sickness and service." "Sunday December 28 1656" is the date of this last will. On the morning of that First Sunday after Christmas he may have joined, as he had often done before, with other members of his Anglican Communion in repeating the creed that embodies the faith of the world-wide Church, saying, "I believe in God the Father Almighty, Maker of Heaven and earth," through all its clauses on to "the resurrection of the body, and the Life everlasting."

On these last four words of the Apostles' Creed young Percy C. Ainsworth, before he passed into the Unseen nearly two years ago, left us these lines:—

"It is not something yet to be revealed—  
The Everlasting Life—'tis here and now :  
Passing unseen because our eyes are sealed  
With blindness for the pride upon our brow.

And if we feel it not amid our strife,  
In all our toiling and in all our pain—  
This rhythmic pulsing of immortal life—  
Then do we work and suffer here in vain."

Our Harvey did not work and suffer here in vain.  
Nor need we—my FELLOW-HARVEIANS.



## ADENOMA VAGINÆ DIFFUSUM (ADENOMATOSIS VAGINÆ), WITH A CRITICAL DISCUSSION OF PRESENT VIEWS OF VAGINAL AND HYMENEAL DEVELOPMENT.

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THIS exceedingly rare condition has been recently described for the first time by Bowley and Bryden Glendinning.<sup>1</sup> Bowley and Glendinning describe the clinical features as follows<sup>2</sup>:—A red granular honeycombed appearance of the vaginal walls, small cysts, and a continuous secretion of a mucous fluid like white of egg.

Pieces of the vaginal lining, when removed and submitted to microscopical examination, gave the following condition:—Epithelium poorly stratified, reduced to a single layer at many places; fibro-muscular stroma, with the muscular element predominant but ill-formed; tissue permeated with numerous gland-spaces lined by a single layer of columnar epithelium, which was traced in continuity with the superficial layer; no elastic tissue immediately under the epithelium, but its presence round the vessels.

In Dr. Haultain's case, malignant disease developed later.

I now take up in explanation of this condition the question of the development of the vaginal tract in the human female, and also in marsupials. This involves the consideration both of vaginal development and also of the nature of the hymen. The first has special bearings on diffuse adenoma of the vagina, but I purpose at the end of the paper also taking up critically the development of the hymen.

If we look at a transverse section of the genital cord<sup>3</sup> in a human embryo about the sixth-seventh week we see in it three lumina; the two outer are the Wolffian ducts, separate, the mesial one the two Müllerian ducts coalesced. It is important to notice

<sup>1</sup> Bowley and Glendinning, "Adenomatosi Vaginae, a Hitherto Undescribed Condition." *Proc. Roy. Soc. Med.*, iv. : *Obstet. and Gynec.*, I. Trans. p. 18.

<sup>2</sup> A case has also been recorded by Dr. Haultain, in whose practice it occurred some time ago.

<sup>3</sup> The genital cord is practically the part where the ducts of Muller, Wolffian ducts, and urogenital sinus are imbedded in connective tissue, and not free at any part of their periphery.

that at this early stage—sixth-seventh week—the septum between the Müllerian ducts has disappeared. The Müllerian duct is lined at this time with a low columnar epithelium. At a certain level of the urinogenital sinus corresponding to a point in the adult vagina an inch or so above the hymen there is a distinct projection on the posterior wall of the duct—the eminence of Müller. Here the Müllerian ducts end blindly. Below the eminence of Müller the Wolffian ducts open one on each side (Fig. 1). The urinogenital sinus is relatively long at this period, and indeed has been described erroneously as the future vagina. At this stage, then, the Müllerian duct, which will form part of the future vagina, has a single lumen, is lined with columnar epithelium, has no lower aperture, and no hymen is present. In earlier sections the ducts are double.

The next distinct stage of development known to me is at the fourteenth week, and this is an important period, as it is at this period of fetal development that the hymen develops. I have examined two specimens at this time, and, so far as I know, no other similar specimens have been described, even by observers who have strong views opposed to mine on the nature of the development of the hymen. Specimens at this period are best cut in the form of a central mesial slab in sagittal central section, as the paraffin blocks are somewhat large, and this direction gives a useful view of the whole tract.

In such a section one can see from above down—(1) The uterus with a lumen and beginning formation of glands; (2) the lower end of the cervical canal blocked with epithelium; (3) the vagina solid with cells, and with a line of clear space between them and the connective-tissue wall of the duct; (4) at the lower end, a remarkable condition, viz. a development of two bulbs of epithelium with cells exactly like the squamous epithelium of the adult vagina, and into one of these I traced the Wolffian duct. From these bulbs

the Wolffian bulbs—the squamous epithelium spreads up into the Müllerian duct, blocks it, absorbs its epithelium, maps out the future fornices, solid also, and passes a short distance into the cervical canal. Outside the bulbs, and higher up, the epithelial streams from each bulb communicate before entering the Müllerian ducts, and one can still see the Wolffian duct lying by the side of the vagina as would be expected (Figs. 2, 3, 4, 5).

Thus, at or about the fourteenth week of fetal life two lateral bulbs develop at the lower ends of the Wolffian ducts at a level a little below the eminence of Müller, where these open into the



FIG. 1.—T. S. genital cord, 6-7 weeks' foetus; in front, urinogenital sinus; between sinus and pouch of Douglas, Mullerian and Wolffian ducts; behind pouch of Douglas, rectum.

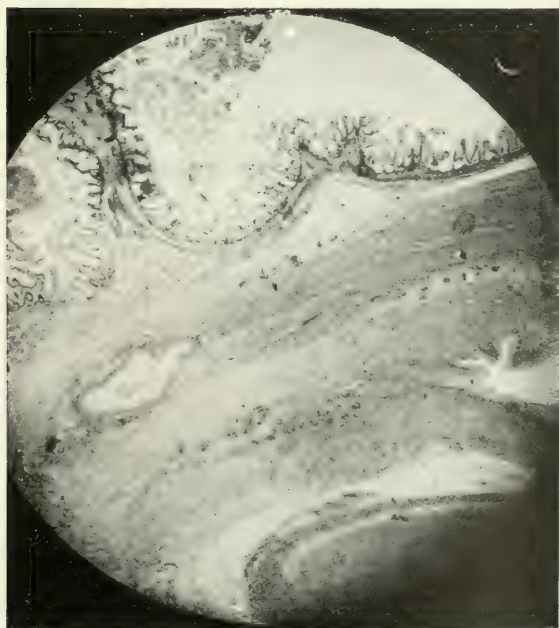


FIG. 2.—Sagittal section of a 6-7 weeks' foetus; at left, side





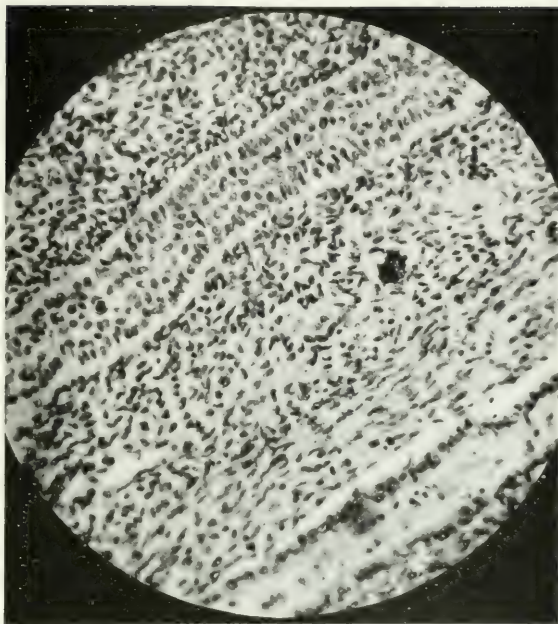


FIG. 3.—Shows solid Mullerian duct above and Wolffian duct below (14th week).



FIG. 4.—Shows large Wolffian bulb above, with epithelium passing into Mullerian duct; below is second Wolffian bulb with Wolffian duct continuous (14th week).



PLATE XII.

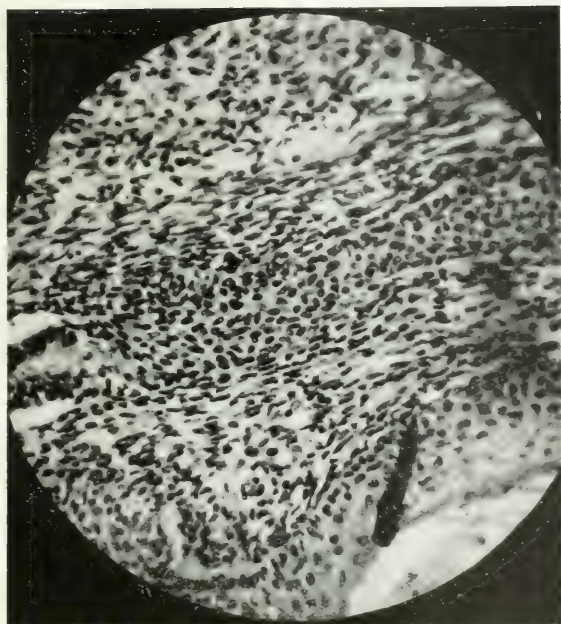


FIG. 5.—Shows Wolffian duct ending in small bulb and part of larger bulb in front at lower right corner.





urinogenital sinus, and thus a little below the site where the Müllerian duct forming part of the vagina ends blindly. These bulbs proliferate in two united columns, pass up into the Müllerian vagina, absorbing its epithelium, and then this solid ingrowth breaks down centrally and gives once more a vaginal lumen. This, however, is now of a stratified squamous nature, able to stand the friction of labour. It is analogous to skin in its structure, and differs from it in not possessing hair or glands.<sup>1</sup>

We get a very striking illustration of this method of development of the vaginal tract if we consider the structure, naked-eye and microscopic, of the vagina in marsupials.

*The Vaginal Tract in Marsupials.*—The vaginal tract in the marsupials is very remarkable, as it is made up of three canals known as the lateral canals and the central canal. The two lateral canals communicate with the upper part of the central one, and open into the urinogenital sinus below. The central canal is a closed pouch usually, but in some, for instance in Bennett's kangaroo, the central pouch communicates directly with the urinogenital sinus. When it does not, it is said that in parturition the embryo passes from the central pouch into the urinogenital sinus, thus breaking down the separating tissue. This is a very extraordinary fact, and it may be that the other view, viz. that the fetus passes down the lateral canals, is correct.

In 1907 I examined microscopically the entire genital tract (one lateral half) of the rat kangaroo, and found a very remarkable condition present.

The lateral canals are lined with a multiple-layered epithelium like that of the adult human vagina, while the central portion has a glandular epithelium. There is thus preserved in the central canal the temporary condition of the Müllerian ducts in the human embryo, and in the lateral canals, epithelium the same as the permanent epithelium which removes and displaces the Müllerian epithelium in the human embryo. The lateral canals are therefore Wolffian ducts in whole or in part (v. d. Broek), the central canal the Müllerian ducts combined, or cervix according to v. d. Broek.

In considering this point again, in view of v. d. Broek's criticism that the whole lateral canals are not a vaginal element, it occurred to me to look over Owen's specimens again. In one of them there is present what looks like an os externum, at or about

<sup>1</sup> Von Preusschen long ago described occasional glands in the adult vagina a fact explained by its development given above.

the lower third of the lateral canal. If this be right, then below the os externum is vaginal; above it, up to the top of the central point, uterine. As it is lined with squamous epithelium in many layers, it corresponds to the part of cervical canal in the human foetus temporarily lined with squamous cells like the vagina.

*Diffuse adenoma of the vagina in the human female is thus a persistence of a fetal condition owing to the epithelium of the Müllerian ducts remaining permanent, probably from its not having been absorbed and replaced completely by the ectodermic cells of the Wolffian bulbs.*

I wish now to discuss the various views of the nature and development of the hymen.

Within the past few years the question of the development of the vagina and hymen has been a good deal investigated, but observers are still at variance in their opinions, and as I am mainly responsible for one of these, viz. that the vagina is Müllerian in its upper two-thirds and urinogenital sinus in its lowest third, and that the hymen originates from the lower ends of the Wolffian ducts and is a development in the urinogenital sinus, I purpose reopening the subject and considering critically its main points.

In the adult virgin female the relations and naked-eye anatomy of the hymen can be observed in an operative case when the patient is under chloroform and in the lithotomy posture. If the labia minora are drawn not too far apart, it will be found to be a double pouting sagittal mesial ridge with the edges of the slit-like opening in apposition (Cullingworth), the upper coalesced ends often overlapping the urethral orifice. The alleged various forms of normal hymen, where the aperture is described as oval, crescentic round, and so on, are due to lateral traction on the edges of the hymen, causing disturbance in their normal apposition. Even when the hymen has a double slit the above applies.

On naked-eye examination of the hymen in anatomical virgin specimens, one can see on its inner aspect rugæ continuous with those of the vagina, as Budin pointed out. Its covering is more analogous to skin, a fact often rightly emphasised as regards the vagina. The microscopical structure of the hymen has been well described by Gellhorn among others. It is covered with a many-layered epithelium on papillæ of connective tissue, with elastic and sometimes unstriped muscle in its substance; special nerve endings have been observed. In the hymen in some atresic cases it has been noted that the inner surface is covered with single-layered epithelium, the outer with multiple-layered epithelium.

Nagel, in a sagittal section of a 4 cm. foetus, describes the eminence of Müller as made up of special protoplasmic cells, and considers the cells at the level of that part of the Müllerian ducts forming the future vagina to be of a different nature from those at a higher level. Any change in the epithelium afterwards he considers as a local development and not an invasion from any other source.

It is very generally held that the hymen is the thinned-out lower end of the vaginal walls. Budin, who stated this view very clearly and fairly, studied it from the point of view of naked-eye anatomy, and pointed out that the vaginal rugae could be traced on the inner surface of the hymen. In this he is quite correct, but in a conversation that I had with him on the subject he stated that this was not conclusive evidence that the hymen had not an origin from the Wolffian ducts.

Pozzi and others have associated the hymen with the vulva, and Matthews Duncan drew attention to the fact that in ordinary atresia hymenealis leading to the retention of menstrual blood the edge of the hymen was present. This I have verified in some cases and found that the hymeneal edge fringed the occluding membrane.

The view that the hymen is vulvar<sup>1</sup> in its nature is quite untenable. The hymen lies, in the adult virgin, in the lower part of the former urinogenital sinus. It is separated from the labia minora, has the vestibule above it and the vaginal aspect of the fossa navicularis between it and the fourchette. Those who hold the view argue by imperfect exclusion, and conclude that if the hymen is not Müllerian it must belong to the external genitals, thus leaving the urinogenital sinus quite out of consideration.

An important contribution to the development of the vagina was made by Tourneux and Legay, and by Nagel, and confirmed by myself and others, when it was pointed out that at one stage of its development the Müllerian lumen became blocked by epithelial cells and was therefore solid for a time.

Klein and Nagel state that at about the fourth and a half month the lower end of the vagina is thus blocked by a mass of epithelial cells, and Klein considered that it was by this breaking down and by an involution from below that the hymeneal aperture was made.

According to Nagel, "the Müllerian ducts are originally composed of large protoplasmic cells of an epithelial character. Around

<sup>1</sup> This view does not include the urinogenital sinus in the vulva.

this mass of cells, which gradually becomes a tube, the mesodermal formative cells are grouped in a circular arrangement, thus forming the first Anlage of the connective tissue and muscular layer of the Müllerian ducts; in other words, the connective tissue appears after the ducts are established, and grows in proportion to and together with the downward growth of the ducts. Thus when the ends of the ducts protrude into the sinus in the form of an epithelial protuberance, their connective tissue comes down with them, grows into the terminal conus, and forms the inner or central layer of the protuberance."

If this be the true mode of origin, "the hymen" (Gellhorn urges) "is a product of the Müllerian ducts exclusively. The epithelium of the sinus urinogenitalis does not play any active part but only covers the outer layers of the epithelium of the Müllerian ducts in the form of a very thin cuticle. Thus it is readily understood why the epithelium of the vulva can be dissected from the hymen as recorded above in connection with the theories of Pozzi and Schaffer" (Gellhorn, *op. cit.* p. 495). Nagel objects to my view that the Wolffian ducts I described may be Bartholinian or a low implanted ureter. The Bartholinian duct, however, has not developed at this period, but does so about the fourth and a half month, and its axis is different, seeing that it runs transversely in to end on the outer aspect of the hymen. A low implanted ureter is exceedingly rare in the adult, and only a few cases have been recorded. I have described such, and shown that the so-called implantation of the ureter is due to a persistent communication of Wolffian duct and ureter; and when the normal development of the ureter and part of the kidney is considered, viz. that it is due to a budding upwards from the Wolffian duct to meet the part developed above from mesoblast, the cause of the anomaly is at once evident.

J. C. Webster of Chicago, in a probationary essay on the "Early Wolffian and Müllerian Ducts" for the Fellowship of the American Gynecological Society, opposes my views and agrees with those of Nagel. The most noteworthy feature of Webster's paper is that he describes no specimens bearing on the development of the hymen. His paper is thus a purely literary one and not of scientific importance. He is not consistent in his criticism, as at page 457 he states "After the careful researches of Nagel and Hart regarding the origin of the hymen, which I have recently corroborated . . ."—but from the fact that he describes or figures no specimens and had previously disagreed with me, the position he there takes up is a puzzling one.



Gellhorn in his paper urges against my view that "systematic researches of other investigators result in an altogether different conception of the course of the Wolffian ducts. Until recently the majority of observers believed that the Wolffian ducts terminated at or near the cervix uteri in the upper part of the vagina. This view can no longer be held. Beigel, Dohrn, v. Ackeren and others first described *rests* of the Wolffian ducts along the entire length of the vagina, and Klein, in 1897, demonstrated in serial sections the course of the Wolffian ducts within the hymen. It must be noted that v. Ackeren, Klein, and Groschuff, Seitz, Hengge, the last three working with Klein, found the Wolffian ducts within the hymen" (Gellhorn, *op. cit.* pp. 428, 429). These facts, however, are not only not against my view but are directly confirmatory of it. Had the Wolffian ducts normally ended above the level of the hymen that might have been fatal to it. What Gellhorn finds in the quotation given against my view I fail entirely to see: in fact it is totally irrelevant, and I see no point in the quotation hostile to my view at all.

Kempe has shown that in the white rat the hymen develops from a bridge of tissue below the ends of the Müllerian ducts (see Quain's *Embryology*, T. H. Bryce).

Dr. Wood Jones, in a valuable paper, has been the first observer to confirm the existence of the double bulbs I have described, and he considers them to be derived from the Müllerian ducts, but the details are not given and there is thus no opportunity of discussing his views. He believes the hymen to be "the tissue these bulbs do not penetrate." He also confirms my statement as to the urethra becoming occluded by the bulbs and re-tunnelled, a process analogous to what happens at the vaginal orifice. Indeed some observers have described what they term a urethral hymen, which is probably due to this urethral perforation.

One difficulty in accepting Dr. Wood Jones's view is that even at the sixth week the Müllerian duct in the genital cord has a lumen and is single. Dr. Jones's view, apart from other points, would require the Müllerian ducts to re-acquire a double lumen.

The view that the hymen is Müllerian has at first sight much to recommend it, but it fails to account for several facts. In Nagel's account he figures, as I have already noted, in a  $\frac{1}{4}$  cm. foetus the urinogenital sinus with the Müllerian eminence made up of well-marked protoplasmic cells, the Anlage of the hymen and vagina, and considers the cells higher up where the uterus and tubes form to be different. The ultimate vaginal lining he con-

siders to be due to a local proliferation, and he figures this as blocking the vagina in a three months' fœtus. Those who accept Nagel's view are omitting the consideration of the all-important stage of the double bulbs I was the first to note. All other observers who figure the epithelium blocking the vagina figure it as a single and local epithelial plug. Of course it is a very evident deduction from their facts that this proliferation and distension open up the lower end of the vagina and form the hymen. These two far apart stages of Nagel from a 4 cm. fœtus to one at the third and a half month are not the only ones, and to criticise my view on them alone must lead to an erroneous conclusion. Gellhorn, indeed, takes this one stage of Nagel's in the 4 cm. embryo, and writes as follows:—"From this eminence the hymen is formed. The fine details may to my mind be conceived as follows:—When the united Müllerian ducts reach the sinus urinogenitalis they push the thin layer of epithelium lining the sinus forward, and by so doing they make this epithelium even thinner than before. This condition is clearly seen in Nagel's picture. In this stage the lower ends of the Müllerian ducts represent a somewhat cone-shaped solid epithelial cord. The formation of a lumen proceeds from above downwards, and this canalisation corresponds with the course of the ducts themselves, with its concavity anterior. Therefore the point where the lumen of the duct breaks through the solid end is as a rule nearer the upper border of the conus and so is responsible for the production of the semilunar form of the hymen, which is by far the most common. The concave course of the Müllerian ducts is due to the curved abdomen of the embryo. The extremity of the conus (Müllerian eminence), with a more or less eccentric lumen projecting into the sinus, consists at first only of the epithelium, covered on the outer surface with a very thin layer of sinus epithelium. Only secondarily is this mass of epithelium invaded by connective tissue" (Gellhorn, pp. 434, 435).

Gellhorn admits that this account of his as to the origin is almost entirely hypothetical, and it is indeed remarkable as a piece of induction. He describes the development as occurring in the stage of the 4 cm. fœtus of Nagel, and does not figure any subsequent stage or indeed describe any such until the fourth month of Nagel's specimens. The hymen is not formed at this early stage but at a much later one—three to four months—so that he rejects my views on insufficient grounds and brings forward a purely hypothetical and wildly improbable theory.

Taussig agrees with Webster and states (in a footnote) that "Webster has fully pointed out the fallacies of his (Hart's) conclusions." He further states that he has assumed that the vagina is entirely formed by the coalesced Müllerian ducts and not to any extent by the urinogenital sinus (p. 99). *i.e.* he assumes what he should prove or disprove and rejects actual specimens in favour of a mistaken preconception.

Bolk in a recent important paper gives the history well, and his conclusions are as follows:—

"Nach Dohrn entwickelt sich somit die Klappe sekundär, hat nichts mit der ursprünglichen Müller'schen Papille zu tun und ist die hymenale Öffnung eine primäre Öffnung, nämlich das nicht ganz verschlossene Lumen des Scheidenkanales. Doch bleibt immerhin der Hymen eine vaginale Bildung. Eine dritte Ansicht, die hier kurz erwähnt zu werden verdient, ist jene von Berry Hart. Die morphologische Deutung der Scheidenklappe, die dieser Autor gibt, hängt mit seiner Auffassung der Entstehung der Vagina zusammen. Es sollte nämlich der untere Drittel der Scheide nicht von den Müller'schen, sondern von den Wolff'schen Gängen gebildet worden sein und demzufolge musz der Hymen als ein Produkt der terminalen Enden dieser Kanäle angesehen werden; so sagt der Autor (l. c. S. 342): 'thus the hymen is formed by a special bulbous development of the lower ends of the two Wolfian ducts, aided by an epithelial involution from below of the cells lining the urogenital sinus.' Schliesslich musz die Auffassung von Pozzi erwähnt werden, der den Hymen als eine vulväre Formation deutet, entstanden aus zwei seitlichen Falten, die sich auf die Seitenwände des primitiven Sinus urogenitalis bilden, und einander entgegenwachsend in der Medianlinie sich verbinden.<sup>1</sup> Der Hymen würde somit paariger Herkunft sein und von dem Müller'schen Hügel ganz unabhängig sein.

"Der zweite Punkt betrifft die Herkunft der Vagina. Die älteren Autoren (Müller, Valentin, Rathke) meinten, dass die Scheide eine differenzierter Teil des Sinus urogenitalis war, eine Ansicht, die durch spätere Untersuchungen als nicht richtig erkannt worden ist. Weitaus die meisten Autoren erblicken jetzt in der Vagina ein Bildungsprodukt ausschliesslich der Müller'schen Gänge. Nur einige wenige Autoren nehmen einen etwas anderen Standpunkt ein. Jener von Berry Hart geht schon aus dem Obengesagten hervor, und wird weiter deutlich durch die zwei

<sup>1</sup> Pozzi's view has been classed with those deriving from the external genitals, omitting the fact that he places the urinogenital sinus with them.

folgenden Sätze: 'The upper two-thirds of the vagina are derived from the ducts of Müller, and the lower third is due to the coalescence of the upper portion of the urogenital sinus and the lower ends of the Wolffian ducts' (i. c. S. 344). Auch Kempe hat sich, was die weisse Ratte betrifft, für eine Beteiligung der Urmierengänge an der Bildung der Vagina ausgesprochen" (Bolk, pp. 252, 253).

Bolk's final conclusions are:—

"Kehren wir nach diesem Excurs zu unserem Gegenstand zurück. Auf Grund meiner Untersuchungen bin ich somit bezüglich der Entwicklung der Urethra, des Septum urogenitale, der Vagina und des Hymen zu einer Auffassung gelangt, die von der mehr geläufigen wesentlich abweicht. In den folgenden Sätzen findet man kurz zusammengefasst die Ergebnisse meiner Untersuchung übersichtlich dargestellt:—

"1. Die Urethra des Menschen ist doppelter Herkunft; der obere Teil geht aus der gemeinschaftlichen Blasen-Urethral-Anlage hervor, der untere Teil stammt vom primitiven Sinus urogenitalis her.

"2. Der kaudale Abschnitt des Septum urogenitale beim Menschen entsteht durch ein Zusammenwachsen zweier Falten, die beiderseitig von der Seitenwand des primitiven Sinus urogenitalis sich erheben, einander nähern, in der Medianebene zur Verschmelzung kommen und in dieser Weise das primitive Septum nach unten verlängern.

"3. Die Vagina des Menschen ist doppelter Herkunft; zum grössten Teil geht sie aus dem untern Abschnitt der verschmolzenen Müller'schen Gänge hervor, dieser Abschnitt ist als 'Pars-Müllerica' zu unterscheiden; der untere kleinere Teil (vielleicht etwas das untere Drittel) lässt sich vom primitiven Sinus urogenitalis ableiten, diesen Teil möchte ich 'Pars adjuncta' nennen.

"4. Der Hymen ist eine durch Faltenbildung der Seitenwände des primitiven Sinus urogenitalis entstandene Klappe, die paariger Herkunft ist, durch Ubergreifen auf die Hinterwand des primitiven Sinus urogenitalis sich zu einer halbmondförmigen Membran ausbildet und durch eine Verschmelzung auch der vorderen Enden beider Falten sich zu einer mehr ringförmigen Klappe entwickelt.

"5. Das Orificium hymenale ist einer primäre Öffnung.

"6. Das Vestibulum vaginae stellt nur einen Teil des primitiven Sinus urogenitalis dar.

"7. Das Perineum anterius (Carina urethralis) ist entwicklungs geschichtlich progressiver Natur" (pp. 265, 266).



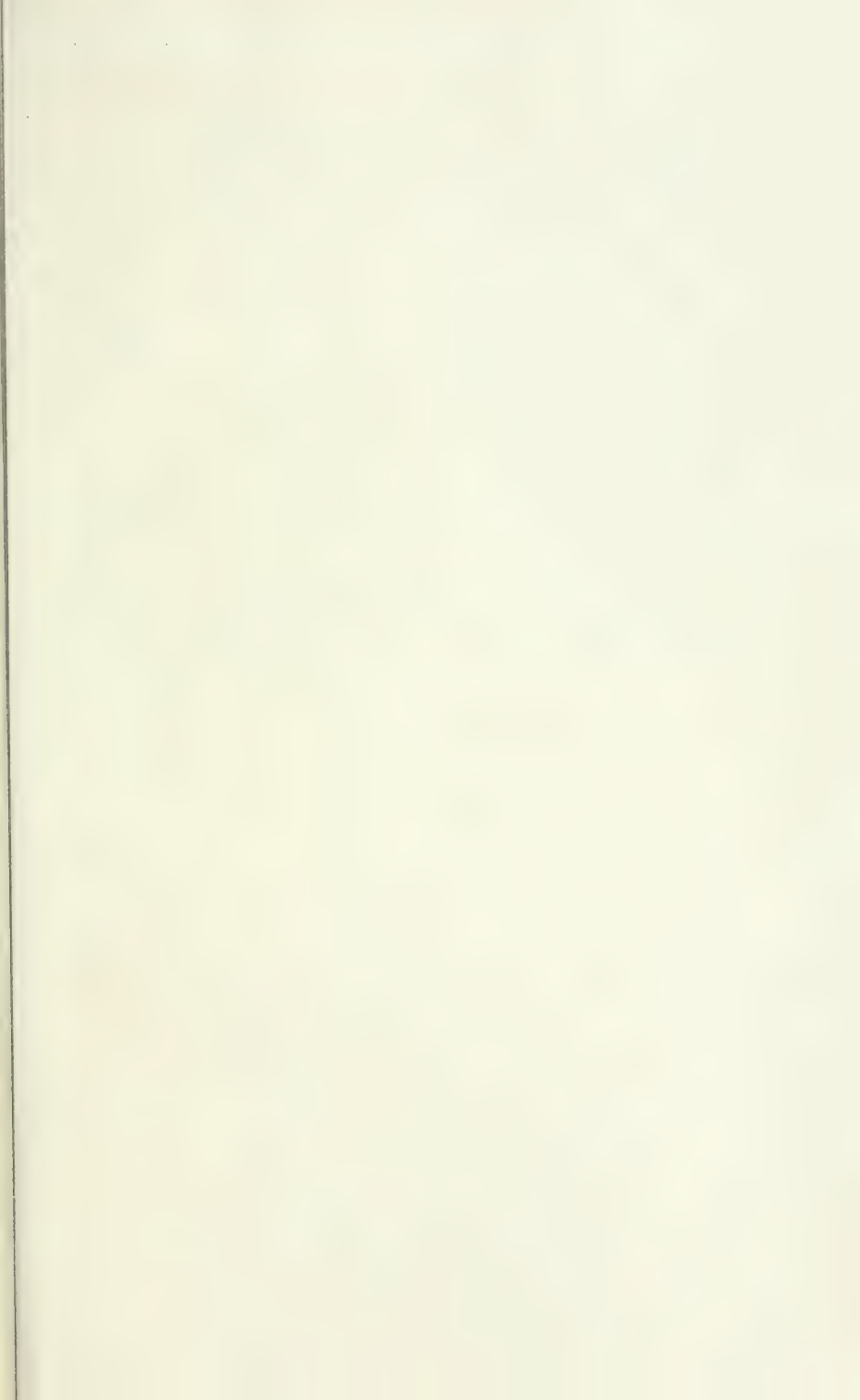


PLATE XIII.

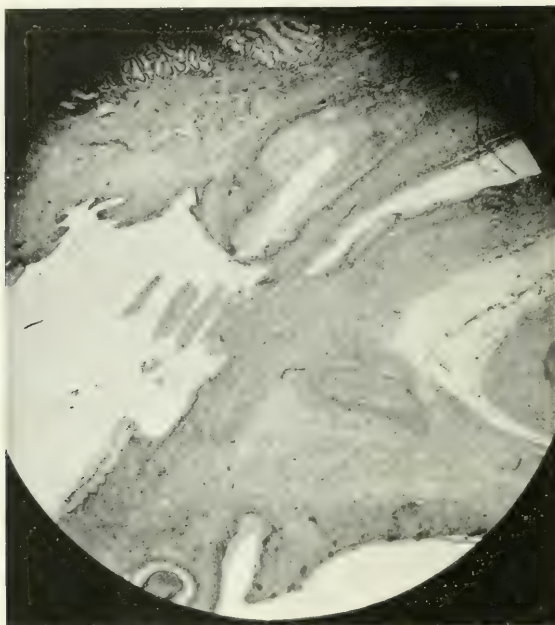


FIG. 6.—Formation of hymen. To left is urinogenital sinus (vestibule) and above Wolffian bulbs breaking down.

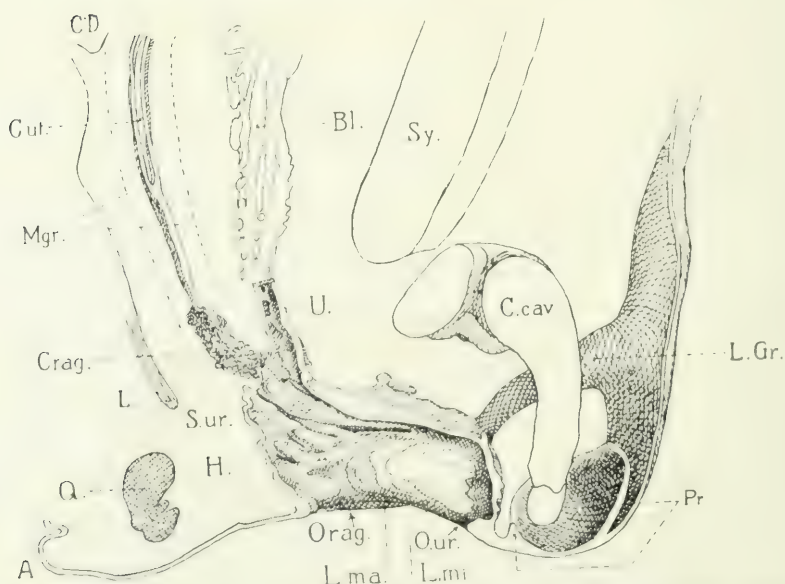


FIG. 7. Mesial sections through the urinogenital sinus of a 1.75 mm. (head-brooch length) female embryo, viewed from within. A. Anterior end of anus; Q. M. Sphincter ani; L. Longitudinal muscle of rectum; C. D. Lateral end of pouch of Douglas, posterior; C. ut. Cavum uteri; M. gr. Boundary of uterine mesenchyme; C. rag. (instead of vag.) Conus vaginalis; Bl. Bladder; U. Urethra; S. ur. (instead of uv.) Plica septi uro-vaginalis; O. ur. Anlage of the ostium urethrae; Sy. Sympysis; C. cav. Corpus cavernosum clitoridis; Pr. Prepuce fold; L. gr. Boundary opposite labium majus; L. ma. Labium majus; L. mi.

My own views, confirmed by Bolk, as stated in 1901, are as follows (*Edin. Obstet. Trans.*, 1900-1, xxvi. 273):—

1. The upper two-thirds of the vagina are derived from the ducts of Müller.

2. The lower third is due to the coalescence of the upper portion of the urinogenital sinus and the lower ends of the Wolffian ducts.

3. The epithelial lining of the vagina is derived from the Wolffian bulbs, which again are epithelial proliferations of the lower ends of the Wolffian ducts. The vaginal mucous membrane is thus ectodermic.

The hymen forms at the Wolffian-ducts-opening and not at the eminence of Müller as usually stated. I think it probable that the Wolffian bulbs block the urinogenital sinus, and that the lumen is re-established as a double one, urethral and vaginal, by an epithelial central resolution and by involutions from the sinus below. Thus in the adult female the vestibule, lower third of the vagina, and lower end of the urethra are derived from the sinus urinogenitalis (pp. 273, 289) (Figs. 6 and 7).

In the new edition of Veit's *Handbuch der Gynäkologie*, Spuler in a comprehensive article emphasises the above views (Bolk's and my own), and gives also his own researches on the comparative anatomy of this region in cavia—felis, ovis, sus—specially on the cavy.

The following are his conclusions (1908):—

“Bei meinen Untersuchungen kam ich in einem wesentlichen Punkt zu einem von den Bolk'schen abweichenden Resultat. Im November 1907 habe ich in der Erlanger Societas physico-medica mitgeteilt: Die Vagina entsteht nach Untersuchungen an Cavia, Felis, Ovis, Sus, speziell an Cavia, und auch an menschlichen Embryonen, aus zweierlei Bildungen: aus einem in den Müller'schen Hügel einwachsenden, dem Epithel des Sinus urogenitalis entstammenden ‘Conus vaginalis,’ der sich später beim Menschen ausserordentlich stark entwickelt und den grössten Teil der Scheide liefert, und durch Aufteilung des grösseren Teiles des Sinus urogenitalis durch zwei ungefähr frontal gestellte Falten in einen vorderen Kanal die sekundäre weibliche Harnröhre, und einen hinteren, den unteren Teil der Scheide: nur der kleine ungeteilt bleibende Bezirk des Sinus urogenitalis wird zum Vestibulum vaginae” (Spuler, Veit, v. pp. 620-621).

We may thus consider the view of the entire Müllerian origin of the vagina and hymen as overturned and its origin in part

(upper two-thirds) from Müller's ducts, in part from the upper portion of the urinogenital sinus, as established. Thus the hymen is not an organ of the Müllerian ducts nor of the vulva but of the urinogenital sinus.

The question of vaginal atresia, and especially of atresia hymenealis, is intimately bound up with this whole question. One special point emerges, viz. that in atresia the initial defect is that the non-breaking down of the solid epithelial formation in the vagina and cervix is the central fact to be taken into account in the formation of many of them, and that when this gives a feasible explanation, as it does in most forms, hypothetical inflammatory changes need not be considered. In atresia hymenalis I have always seen the edges of the hymen and an unbroken diaphragm more or less thick between them. Some observers allege that in such the hymen may not be present. It has always seemed to me that the preponderating number of cases, at any rate in which the hymen edges are present, is due to the fact that the development of the hymen is intimately bound up with that of the ducts of such important early secreting organs as the Wolffian ones, organs essential to healthy development, and therefore structures whose absence or malformation entails serious nutritional defects. When the blocking epithelium in the vagina does not break down we get varieties of atresia, and these are easily understood in the light of the development given. Thus when the epithelial plug of the two Wolffian bulbs forming the hymen does not break down we get atresia hymenealis. Very rarely is there a transverse septum an inch from the septum hymen, but I have seen two such, and it is probably the lower end of the true Müllerian vagina, where the eminence of Müller was, that is imperforate. When all the solid epithelium in the vagina does not break down we get complete atresia of the vagina; when only that in the cervix, we get a retention of blood in the uterus hematometra (Fig. 8).

In review, then, it will be seen that these two views of the origin of the hymen, viz. from the Wolffian ducts and sinus or from the Müllerian ducts, are sharply contrasted as to the origin of the hymeneal and vaginal lining; the one urges a local change from early protoplasmic cells to squamous multiple epithelium, the other an invasion of squamous cells from the Wolffian bulbs into the Müllerian duct as far as the lower third or so of the cervical canal.

The view I bring forward is an interpretation so far as possible



of what appears to take place during this development and an attempt to explain how the adult tract is formed. Development proceeds from the stage of the double Wolffian and Müllerian ducts and the urinogenital sinus with its single structure, from the blind ending of the Müllerian and patency of the Wolffian ducts, up to the formation of the adult tract, where we find the hymen present, the vagina provided with a skin-like multiple-layered lining, and uterus and tubes with a mucous membrane of a totally different nature. The Müllerian view states that the double Müllerian tubes (vaginal portions) coalesce, the epithelial lining of the hymeneal and vaginal Anlagen becomes converted into a multiple-layered epithelium which first occludes the vagina and then breaks down to form a lumen. A special increase of this epithelium at the lower end of the vagina by its bulging and pressure forms the hymen and hymeneal aperture.

How in the view of the Wolffian origin of the hymen does the vagina get its different lining as compared with the uterus and tubes? By the development of the Wolffian bulbs from an ectodermic source, viz. the lower ends of the Wolffian ducts, their coalescence to form the hymeneal ridges, and the passage of their epithelium into the vaginal tract rendering it solid up as far as the lower third of the cervical canal. If the vagina at this stage of occlusion is examined it will be seen to be, not a mere local proliferation of the epithelium lining its walls, but an actual solid plugging continuous with the epithelium of one of the bulbs. It may be urged that this description of the invasion of the vaginal lumen from the bulbs is an unusual phenomenon and therefore more likely to be an erroneous interpretation, but it is really quite analogous to what happens in the development of other organs; thus the glans penis is tunnelled in the same way, the open urethral canal in the male is closed in the same way, and, to take a simple instance, a sweat gland is first a solid epidermic plug with surface cells central and develops its lumen by these breaking down. In fact, the special value of an epidermic plug as a solid structure, or in the epidermic invasion of a lumen, is that it has in its centre surface-cells with a power of desquamation thus forming the lumen. In the bulbs one sees that the central cells are analogous to the superficial cells of epidermis or vagina, are desquamating to form the hymeneal opening. What happens there, occurs higher up in the vagina in the vaginal fornices, and in the cervical canal in its lowest third, so that the whole genital tract is ultimately pervious and provided in each segment with a lining appropriate to its functions.

From all this it follows, as already said, that adenoma vaginae diffusum is a persistence of an embryological condition due to a practical absence of the epithelium relining the vagina at the third month. It is of great interest to note that malignant disease supervened in Haultain's case.

The question arises as to whether anything can be done for such cases. The only thing I can suggest is either entire excision or that flaps of skin be taken from the labia majora, and by them, after curetting, and in a way I need not detail, a skin covering provided for the vaginal walls.

LITERATURE.—Bolk, *Beiträge zur Affinuatomie*, vi., "Zur Entwicklung und vergleichenden Anatomie des Tractus urethro-vaginalis der Primaten," mit 33 Figuren; *Zeitsch. für Morph. und Anthropologie*, 1907, x. (p. 250). Gellhorn, G., "Anatomy, Pathology, and Development of the Hymen," *Amer. Gynec. Trans.*, 1904, p. 405. Hart, D. Berry, "Morphology of the Human Urinogenital Tract," *Journ. of Anat. and Phys.*, xxxv. p. 330; also *Brit. Med. Journ.*, 13th September 1902. Klein, *Entstehung des Hymen*, Wien, 1897. Nagel, W., "Entdeckung und Entwicklungsfehler der Weiblichen genitalien," *Veit's Handbuch der Gynäk.*, 1897, Bd. i. Spuler, "Über die normale Entwicklung des weiblichen Genitalapparates," *Veit's Handbuch der Gynäk.*, v. p. 576. Bergmann, Wiesbaden, 1910. Taussig, "The Development of the Hymen," *Amer. Journ. of Anat.*, 1908. Webster, "Early Wolffian and Mullerian Ducts," *Amer. Gynec. Trans.*, 1898. Wood Jones, "The Nature of the Malformations of the Rectum and Urinogenital Sinus," *Brit. Med. Journ.*, 14th December 1904. For full literature see Spuler and Gellhorn.

## ECLAMPSIA ORIGINATING IN THE PUERPERIUM.

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SCOTLAND has an unenviable notoriety in the matter of eclampsia. We have a considerably greater proportion of cases than any other portion of the British Isles and most parts of the Continents of Europe and America. Whether this is due to climatic, or to dietetic, or to racial peculiarities, is as yet unknown. The moral, however, is obvious, and places upon us a certain responsibility in regard to the study of this most baneful condition. No apology, therefore, is needed for trying to focus attention for a short time upon one of the more uncommon varieties of the disease—that which originates in the puerperium.

Several reasons unite to make it desirable as well as interesting to consider this variety of eclampsia apart from the more common forms occurring in pregnancy and labour. In the first place, the time of the occurrence makes it an even more alarming and disconcerting complication than usual, for, after delivery is safely over, it is both natural and legitimate to look forward to an easy and uneventful period of recovery. The sudden onset of convulsions is therefore calculated to create something little short of consternation in the mind of the physician, as well as of the relatives and friends, who have all come to regard the troublous and dangerous time as over.

As it is the exception for eclampsia to occur during pregnancy without warnings which are legible to those who take the trouble to look for them, so it is rare for eclampsia to originate in the puerperium without warnings of some sort having been present beforehand. But after labour is safely over such warnings, even if they have been recognised, are very apt to be forgotten or masked. It is this that makes post-partum eclampsia so often appear to be an unexpected and fulminant disaster.

Again, post-partum eclampsia is not easily brought into line with the other forms in regard to its causation. No theory up to the present has satisfactorily explained the cause of eclampsia in its more common forms, but almost all theories become more or less abject failures when an endeavour is made to fit them to the problem of post-partum eclampsia.

Speaking generally, this variety occurs about once in every five eclampsias. In the Maternity Hospital of this city the exact proportion is 12·6 per cent., but taken all over it is probably about 20 per cent. These figures, of course, only refer to those cases which *originate* for the first time after labour, not to cases in which the fits continue from the time of labour or pregnancy. In its nature the condition, as it occurs for the first time in the puerperium, differs in no way from the usual. There are generally prodromal symptoms. Both the symptoms and physical signs, however, are apt to be masked by the preceding labour. It is most usual for the attack to come on within a few hours of labour, and thus the prodromal symptoms may either not have time to declare themselves, or they may be regarded merely as the after-effects of the strain of parturition. In this way, for example, general malaise, headache, and even epigastric pain may be misinterpreted. Similarly, the condition of the urine, which is the great physical sign in these cases, is rendered difficult of interpretation by the admixture of the lochia, and a catheter specimen has to be obtained before anything can be deduced from it. For this very reason the routine examination of the urine is scarcely ever made, and so we miss the danger signal that it so often gives us during pregnancy.

*The time of onset* is, as has just been mentioned, usually within the first twelve hours of the puerperium. A very characteristic record, for example, is given by eighteen cases of the kind in the Maternity Hospital in Edinburgh, whose records I have been enabled by the kind permission of the staff to examine.<sup>1</sup> Four of these began within one hour of delivery, six more before twelve hours had elapsed, three between the twelfth and twenty-fourth hours, three on the second day, one on the third, and one probably genuine case on the eighth day after labour. Similarly, of twenty-two cases recorded by Meyer-Wirz,<sup>2</sup> eighteen began on the first day, two on the second, one on the fourth, and one on the fourteenth day after labour.

It is very doubtful if such cases as the last can be regarded as true eclampsia at all. Probably all cases occurring after the first week or thereby are really cases of uræmia dependent on chronic organic lesions of the kidneys. There are, however, on record numerous cases of so-called eclampsia originating long after that time. Baudelocque,<sup>3</sup> for example, to quote only the giants, records one on the forty-fifth day, and Sir James Simpson<sup>4</sup> published two occurring in the eighth week. The modern conception of eclampsia



forces one to the conclusion that these must have been cases of uræmia from chronic nephritis, and their connection with the puerperium largely accidental.

The *number of fits* is usually small—frequently just one or two. The greater the number of fits, the more grave the case becomes.

I should like here to interpolate the record of a fairly characteristic and very interesting case which was admitted to the Edinburgh Maternity Hospital some months ago, and which I am enabled to publish through the kindness of Professor Sir Halliday Croom:—

The patient was a woman of 30, who had had five children previously. Her general health had been good, with the exception that she had once or twice had fits, quite apart from pregnancy. There was said to have been swelling of the ankles before the birth of all her children. After the fourth labour she had “fits”—two hours post-partum. During this last pregnancy she had suffered from excessive salivation, and two months before term from swelling of the face and ankles, headache, and giddiness. There was pain on micturition, and a diminution in the quantity of urine. During the last two months she complained of pain “below the right breast.” Labour ensued on 14th December 1910, and was normal. At the time her face and ankles were somewhat swollen. Nine hours after labour this condition was observed to be increasing, and the urine was found to be loaded with albumen. Later she complained of feeling ill, the pain under the right breast became greatly aggravated, and the pulse was noticed to have run up to 132 per minute. Exactly twelve hours after labour she had two fits in rapid succession, and remained quite unconscious subsequently. In this state she was admitted to the hospital, comatose, breathing stertorously, and with a pulse of 100, blood-pressure 195 mm. of Hg, and temperature 99·6 F. She was immediately bled and 2 pints of normal saline solution passed into the vein. The stomach was washed out and 6 ozs. of Henry’s solution left in it. The rectum was washed out with a copious result, and a pint of saline solution left in the bowel. The blood-pressure promptly fell to 115 mm., and 6 ozs. of urine were drawn off. This was found to be loaded with albumen and blood, and to contain a quantity of urea so small that it could not be estimated. After this the bowels and kidneys acted freely. She was treated with further saline infusions and stimulants, but gradually sank, and died twenty-four hours after labour. About two hours before her death she rapidly became very jaundiced.

At the post-mortem examination the following points among others were noted:—

Lungs—Œdema and congestion.

Liver—No alteration in size; an extensive subcapsular hæmorrhage

principally over the left lobe; colour, light yellow; on section extensive fatty change is seen, the fat globules being small and numerous within the liver cells; sections stained with hæm.-eosin show hæmorrhages and characteristic areas of focal necrosis.

Kidneys—Somewhat enlarged, fairly firm in consistence; on section cortex slightly swollen, pale and opaque. Frozen sections show characteristic appearances of acute catarrhal nephritis.

This case illustrates a number of interesting points. There is, in the first place, the existence during pregnancy of definite warning signs and symptoms in the swelling of hands and face, giddiness, diminution in the quantity of urine, and, lastly, in the pain under the right breast. This last is a symptom of peculiar interest, especially in view of the fact that it became so much more intense just before the onset of the acute symptoms. Severe pain in the epigastric or right hypochondriac regions is not very uncommon in eclampsia, but it has hardly received the attention that is its due. Cases have been recorded in which it was the *only symptom* preceding an attack of convulsions. So far as I am aware, the only explanation that has been offered is Olshausen's<sup>5</sup> suggestion, that it is due to the secretion into the stomach of some pathological substance. Such a substance has, however, never been demonstrated, and washing out the stomach does not appear to relieve the symptom. For these reasons, and also because the liver in eclampsia is vastly more subject to morbid changes than the stomach, it seems not unlikely that it is a referred pain due to morbid processes going on in this viscus. In the individual case before us the acute exacerbation of the pain shortly before the fits began may be taken as corresponding to the acute stage of the toxic process indicated at the autopsy by the hæmorrhages into the substance, and more particularly under the capsule of the liver. Be the explanation, however, what it may, it is important to bear in mind the possible significance of such pain, as in post-partum eclampsia it may well be the only symptom that is not obscured and masked.

In the second place, this case was surprising in its morbid anatomy. Having regard to the history of puffiness of the face and ankles in *all* her previous pregnancies, and to the previous attack of convulsions after the fourth confinement, one would certainly have expected to find some definite chronic organic change in the kidneys. Both macroscopic and microscopic examination, however, showed changes characteristic of recent acute catarrhal nephritis, and of that alone. The liver also showed lesions typical of acute eclampsia, and no chronic changes. The case, therefore,

affords proof of the purely toxic nature of eclampsia, as well as of the fact that non-fatal attacks may pass off and leave no permanent damage to the organs most affected. This in its turn partially explains the generally recognised fact that one attack of eclampsia recovered from usually confers immunity from further attacks in subsequent pregnancies.

The *prognosis* in post-partum eclampsia is a curiously unsettled point. The general trend of opinion amongst those who have written on the subject is that it is usually a more benign form than either ante-partum or intra-partum eclampsia. This on the whole seems to be borne out by most tables of statistics. The mortality in the eighteen cases in the Edinburgh Maternity Hospital, to which I have referred, was 33 per cent., or about one in three, but, if we take the figures of several authors, we find the proportion varying from 5 to 43 per cent., and we find opinions recorded corresponding to both extremes. Thus of six cases seen by Sir Halliday Croom five died. Again, three out of four cases died in St. Mary's Hospital, Manchester, in 1908.<sup>6</sup> Dr. Fletcher Shaw,<sup>7</sup> the pathologist to that hospital, in a short note in the *British Medical Journal* states that of eight cases of the kind in the hospital during four years only one recovered—a mortality of 87 per cent. There are therefore not wanting those who regard it as the most dangerous form of eclampsia, and the question remains whether there is not some explanation which will reconcile these very divergent views.

It would be tedious to discuss the various theories of the etiology of eclampsia, and note exactly where and how they fail to fit the problem of post-partum cases. Those interested will find such a discussion elsewhere.<sup>1</sup> Suffice it that no theory based upon the presence of the fœtus or placenta will answer, nor has any fully satisfactory theory of disordered metabolism yet been formulated.

Dienst,<sup>8</sup> one of the greatest European authorities on the subject, inclines to regard post-partum cases as due to the products of the involution of the uterus. He attributed it to partially oxidised products of involution passing into the circulation and embarrassing the liver. Since that view was put forward our knowledge has increased along two lines. In the first place, it is now supposed that eclampsia is due to autolytic ferments passing from the placenta to the liver and kidneys, and in these organs setting up a process of autolysis. In the second place, recent work on the nature of the processes involved in the involution of the uterus has shown that that also is to some extent a process of autolysis. It therefore seems quite conceivable that in

some cases the ferments associated with the involution process may pass into the circulation and reach the liver, and there start the destructive process.

I believe, however, that, so far as our present knowledge goes, no one theory will explain all cases of post-partum eclampsia. I think that we must regard them as falling into two classes. Those cases that arise within, say, the first twenty-four hours of labour are, in all probability, due to the same cause as is productive of the condition during pregnancy and labour—presumably to placental ferments. On the other hand, those cases that arise later, especially on and after the second day, may quite possibly be due to the same process set up by ferments, not from the placenta, but from the involuting uterus.

Such a division into early and late cases (although I do not know where exactly the dividing line is to be drawn) enables us to form some explanation of another interesting observation. Olshausen<sup>5</sup> noted in his series of cases that, where the attack came on early, the fits were usually few in number and the prognosis uniformly good; but where the attack came on later, the fits tended to be more numerous, and the prognosis bad. In order to test this observation I append an analysis from this point of view of the eighteen cases in the Edinburgh Maternity Hospital to which I have already referred. It will be seen that they confirm Olshausen's view to a great extent, cases originating after about thirty-six hours tending to have more fits, and certainly being more fatal.

ONSET WITHIN 24 HOURS AFTER LABOUR.

No.	Time of Onset.	No. of Fits.	Result.
1.	$\frac{1}{2}$ hour after labour	23	Death.
2.	1 " "	1	Recovery.
3.	1 " "	2	"
4.	1 " "	3	"
5.	2 " "	2	"
6.	$5\frac{1}{2}$ " "	2	"
7.	$6\frac{1}{2}$ " "	1	"
8.	10 " "	5	"
9.	10 " "	10	Death.
10.	12 " "	2	Death. <sup>1</sup>
11.	$19\frac{1}{2}$ " "	1	Recovery.
12.	21 " "	1	"
13.	23 " "	3	"

13 cases ; 3 deaths ; mortality = 23 per cent.

<sup>1</sup> Case recorded in detail above.



ONSET FROM 24 TO 48 HOURS AFTER LABOUR.

No.	Time of Onset.	No. of Fits.	Result.
14.	36 hours after labour	9	Recovery.
15.	48       "       "	2	
16.	48       "       "	"many"	Death.

3 cases ; 1 death ; mortality = 33 per cent.

ONSET AFTER SECOND DAY OF PUERPERIUM.

No.	Time of Onset.	No. of Fits.	Result.
17.	2½ days after labour	"many"	Death.
18.	8       "       "	3	Death.

2 cases ; 2 deaths ; mortality = 100 per cent.

Now in all toxic affections of the nervous system there are two factors to be considered—firstly, the condition of the nervous system as to stability, and, secondly, the dose or virulence of the poison. Thus in a patient of unstable nervous equilibrium, or with a nervous system weakened by disease or strain, a small dose of poison may well be sufficient to precipitate convulsions. On the other hand, in a patient of more stable nervous equilibrium a more massive dose or a more potent poison will be required to produce the fits.

Bearing in mind these considerations, may we not regard the early cases as induced by a poison existent during pregnancy and labour, but of such low potency that it is unable to affect the nervous system to any manifest degree, until after the latter has been weakened by the strain of labour? This weakness (or the small dose) of the poison explains the small number of fits and the generally good recovery. Late cases, on the other hand, may be regarded as due to a gradually accumulating dose of poison, resulting from the activity of ferments from the involuting uterus. Obviously this source of ferments, if such it be, will become increasingly productive as the process of involution goes on. Hence the probability of a greater number of fits, and the increasing frequency of a fatal termination. I believe that some such explanation as this must be at the root of the really remarkable divergence of opinion as to prognosis that has already been mentioned.

It may be objected that the case narrated above does not tally with this theory—that it was an early case, that the fits were only two in number, but that in spite of this the patient died.

Against this, however, we must put the facts that (1) she had, as shown by her history, a nervous system of decidedly unstable equilibrium, and one apparently susceptible to poison; and (2) the nervous system had been slowly poisoned during pregnancy, as evidenced by the excessive salivation and the œdema of face and limbs. In this case, therefore, we have the weakness of the poison to some extent counterbalanced by a susceptible and already partially poisoned nervous system, and so the fatal result is not surprising.

There is no need to enlarge here upon the subject of *treatment*. There can, of course, be no obstetric treatment, unless there be reason to suspect that some portion of the placenta has been left in the uterus. If such should be the case, its removal may have to be considered. The main principles of treatment must be to promote elimination by every possible channel. Thus the lower bowel should be washed out freely, and hot saline solution may with advantage be left in it to stimulate the kidneys, as well as by absorption to dilute the toxins. The stomach should also be washed out if possible, and it is well to leave in it several ounces of a strong saline purgative—Henry's solution, for example. Hot packs may be required to stimulate the skin's action, and bleeding from the median basilic vein is very useful where the blood-pressure is high. The patient must be kept absolutely quiet in a darkened room, and protected as far as possible from noise and other external stimuli. Feeding is probably better avoided during the acute stages. The patient will be able to exist on the saline fluids, which should be regularly administered either by the bowel, or by hypodermic injection into the loose cellular tissue under the breast, or by intravenous injection. Administration of ether by the open method may be necessary to control the fits: chloroform should be avoided owing to its action on the liver.

The post-partum variety of eclampsia, when accompanied by complete or almost complete anuria, is the indication *par excellence* for the operation of decapsulation of the kidneys. Since this operation was introduced by Ekebohlz for the relief of chronic nephritis, it has been tried in cases of eclampsia some thirty or forty times. The results have not been brilliant, but with a more careful choice of cases they may be expected to improve. Post-partum cases are the most suitable, because before or during labour

one would hardly feel justified in adopting such a drastic measure without first trying the effect of the evacuation of the uterus. I have had the opportunity of seeing this operation carried out in one case in the Maternity Hospital here. The result was conspicuously successful.<sup>9</sup>

Finally, in regard to prophylaxis. Although cases of this kind are rare, still they serve to remind us of the danger incurred by want of attention to the warning signals exhibited during pregnancy. It is not enough that cases showing toxicæmic symptoms during pregnancy should receive special care up to the time of labour. The early days of the puerperium require equally careful watching. It is no longer possible to avoid the conclusion that eclampsia is, in the great majority of cases, a preventable condition, and this applies not merely to the ante- and intra-partum varieties, but, with a little additional exercise of care, to post-partum cases likewise.

REFERENCES.—<sup>1</sup> Johnstone, *Journ. of Obstet. and Gynec. of the Brit. Emp.*, January 1910. <sup>2</sup> Meyer-Wirz, *Arch. f. Gynec.*, 1904, vol. lxxi. p. 15. <sup>3</sup> Baudelocque, *L'Art des Accouchements*, Paris, 1807, vol. i. p. 487. <sup>4</sup> Simpson, J. Y., *Obstet. Works*, ed. by Priestley, vol. i. <sup>5</sup> Olshausen, *Volkmann's Sammlung klin. Vorträge*, N. F. 1892, No. 39. <sup>6</sup> *Report of Maternity Department St. Mary's Hospital, Manchester*, 1908, p. 24. <sup>7</sup> Fletcher Shaw, *Brit. Med. Journ.*, 1910, vol. ii. p. 1306. <sup>8</sup> Dienst, "Krit. Studien über die Path. der Eklampsie," *Arch. f. Gynec.*, 1902, vol. lxxv. p. 369. <sup>9</sup> Halliday Croom, "Renal Decapsulation in Puerperal Eclampsia," *Edin. Med. Journ.*, 1900, New Series, vol. ii. p. 443.

## CLINICAL RECORD.

A CASE OF ADENOMA OF THE VAGINA UNDER  
OBSERVATION FOR FIFTEEN YEARS.

By F. W. N. HAULTAIN, M.D.

IN September 1896 I was consulted by Mrs. S., aged 35, who complained of a copious watery discharge from the vagina and something protruding from the vulva. On examination I found a swelling of the anterior vaginal wall, which protruded slightly from the vulva and simulated a cystocele. It was hard and well defined—about the size of a walnut. The vaginal walls were of an intensely pink colour, and secreted freely a thin watery discharge.

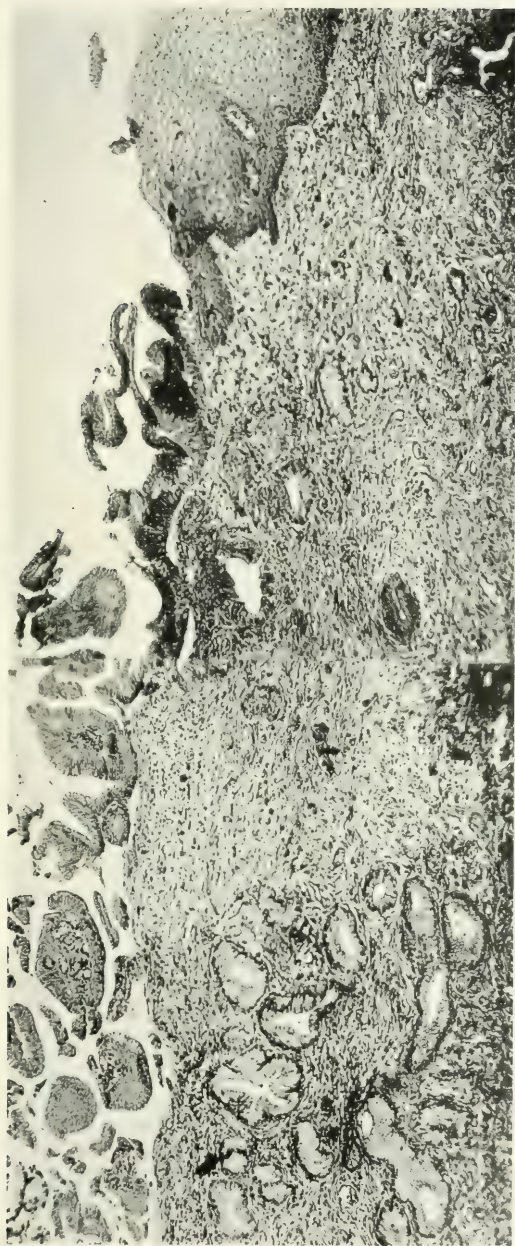
I removed the swelling on the anterior vaginal wall, which though apparently well defined was extremely difficult to enucleate. On section it presented the appearance of a fibro-adenoma. I intended to show it at the Obstetrical Society, but, unfortunately, my museum was burned and the specimen destroyed. I at the same time removed a portion of the vaginal wall and found it covered with an adenomatous structure, which closely resembled the appearance of a cervical erosion. Subsequently I thoroughly scraped the vagina and swabbed it with tincture of iodine, in the hope that I might destroy the glandular growth.

For some months she was much better, but returned later with the same watery discharge. As the vagina presented a similar appearance as before, I repeated the curetting and swabbed with pure carbolic. This, again, cured the discharge for a period of about eighteen months, but it reappeared, and the vaginal walls presented the same pink appearance. As she was much averse to any further operative procedure, I recommended syringing with astringents such as alum and sulphate of copper, but these exercised very little beneficial effect.

I lost sight of her entirely until June last year (1910), when she again consulted me, complaining of severe heat in the vagina and frequency of micturition. On examination I now found the vaginal walls greatly thickened, of the same pinkish colour, and showing warty-like protuberances on the surface. I again excised a small portion of the vaginal walls for diagnostic purposes and found it to show, as the microscopic specimen demonstrates (Plate XIV.), the same adenomatous character as previously, but very much more exaggerated, the glands now penetrating and replacing the squamous epithelial covering and dipping deeply into the muscular tissues. She was now soiling



PLATE XIV.



DIFFUSE ADENOMA OF VAGINA.

On right, ordinary squamous epithelial covering; on left, papillary glandular covering with adenomatous infiltration of vaginal wall.



from eight to ten diapers a day with the thin watery discharge, and said she had done so more or less for the last eight years. At no time had she complained of irregular hæmorrhage, and there was no evidence of ulceration by examination. She gradually became weaker, and died of pure asthenia on the 15th March last.

Beyond considerable discomfort from her bladder, there was no great pain suffered. Unfortunately post-mortem examination was refused.

There can be little doubt that the case was a typical example of a diffuse adenoma of the vagina, simple in its early stages, but eventually in the course of time, from penetrating the surrounding structures, becoming what might be termed adenoma malignum.

A similar case in its early stages has been described by Bonney, and was stated by him to be unique, so that the condition must be considered of great rarity.

In these days of thorough surgical interference I would not hesitate, if a similar case presented itself, to remove thoroughly the uterus and vagina, as it seems to me that, though simple in origin, all such cases must tend eventually to pursue the course which was followed in this instance. As to the origin of this extraordinary condition I am not prepared to give an opinion. Both Berry Hart and Bonney consider it to be due to some developmental anomaly associated with the Wolffian ducts. These, as is well known, are supposed to account for the formation of vaginal cysts, which, however, differ very much in the character of their epithelium from the case above described. This, as is shown in the micro-photographs, is of a cylindrical type, resembling closely the lining of the cervical glands. It is possible, therefore, that the condition may be due to an exaggerated formation of cervical erosion spreading to the vaginal walls.

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## MEETINGS OF SOCIETIES.

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### Edinburgh Obstetrical Society.

THE sixth meeting of the session was held on 10th May 1911, Dr. Haultain, President, in the chair.

The President exhibited (*a*) photographs of an œdematous fœtus; (*b*) sarcoma of the uterus; (*c*) extra-uterine pregnancy, with perforation of uterus; (*d*) microscopic sections of diffuse adenoma of vagina.

The President read a "Note of a Case of Adenoma of the Vagina," which appears in the *Journal* (p. 600).

Dr. Berry Hart read a paper on "Adenoma Vaginæ Diffusum (Adenomatosi Vaginæ)," with a critical discussion of vaginal and hymeneal development, which we publish *in extenso* (p. 577).

The Secretary read a communication by Dr. A. E. Turnbull, Broadway, Dorset, entitled "Short Note of a Case of Superfoetation." The patient, a primipara, æt. 24, was attended by Dr. Turnbull in her confinement on 11th March of this year. She then considered herself about  $6\frac{1}{2}$  months pregnant, but was very uncertain. Labour had commenced about 3 A.M., the membranes rupturing an hour later. On Dr. Turnbull being called at 5 P.M. he found the uterus extending to the xiphoid cartilage, tender on percussion, and obviously over-distended. The nurse asserted that the membranes had ruptured, and this was confirmed on vaginal examination, when the os was found nearly fully dilated and a head presenting. A diagnosis of twins was made, the large size of the uterus being put down to an excess of liquor amnii with the second ovum. Pains being ineffectual, the first child was delivered by forceps. The membranes of the second child were ruptured, liberating a very large quantity of liquor amnii, and a little later the second child was born. There was a single large placenta, a single chorion, and two amniotic sacs. As the membranes came away another body also came out of the uterus. This proved to be a third ovum, complete and healthy, containing a fœtus of about  $3\frac{1}{2}$  months. Unfortunately, almost immediately afterwards, whilst the doctor's attention was occupied with the mother, the nurse destroyed this along with the placenta and membranes. The twins lived only a few hours and the mother made a normal recovery. The twins appeared not to be older than 6 to  $6\frac{1}{2}$  months.

The author concluded that the case was one of superfoetation, firstly a uniovular twin pregnancy with hydramnios of one sac, then fertilisation of the second ovum, evidently about 3 months after the first. He claimed that it proved that ovulation continued at any rate during the early months of pregnancy, in which case fertilisation of a second ovum was possible so long as the decidual space remained, that is up to about the end of the fourth month.

## RECENT LITERATURE.

### CRITICAL SUMMARIES AND ABSTRACTS.

#### OBSTETRICS AND GYNECOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.,  
Lecturer on Midwifery and Gynecology, Surgeons' Hall and School  
of Medicine for Women, Edinburgh.

#### ANÆSTHESIA IN OBSTETRICS.

SINCE Sir James Simpson first used ether in midwifery practice, on 19th January 1847, and since he replaced that agent by chloroform in



the November following, sixty-four years have passed away, and countless women have had the pains of labour assuaged by one or other of these anesthetics. But there has been a constant striving after other means and other methods of producing the same results, or, according to the innovators, better ones. Many new agents have been introduced, lauded, criticised, and abandoned again, but of the more recent introductions scopolamine seems to have impressed itself more upon the attention of the profession than many others.

Professor Lequeux's review of scopolamine in midwifery (*L'Obstétrique*, 1911, N. S. iv, 165) occupies sixty-nine pages of a journal, and is thorough and painstaking. In this full account the history of the method is given, statistics are collected, and various opinions are analysed. Steinbuechel introduced scopolamine into obstetrics, and Gauss pushed its employment so enthusiastically that it has sometimes been called Gauss's method.

To the English reader it is significant that nearly all the names of the obstetricians who have praised it or who have criticised it are not British but continental, although it has found supporters as well as critics to some extent in America. It may be said, therefore, that the question whether or not scopolamine is to be the obstetrical anæsthetic of choice is being decided outside the borders of the United Kingdom. Whilst it may not be generally admitted that the scopolamine-morphine method has been found wanting, it cannot be denied that it has met with much opposition from Hocheisen and many others (Bardeleben, Gminder, Veit, Bumm, Steffen), that it has been severely criticised, and that it has been shown to be not free from danger. Lequeux has endeavoured to form just conclusions on the matter, to some of which I may here refer.

The scopolamine method aims at producing a state of partial sleep (*demi-sommeil*) in which the pains of labour shall be little felt and yet the consciousness of the woman maintained, in which the uterine contractions shall not be enfeebled, in which the fetus shall not suffer, and in which no painful memories shall remain after the labour is over. How these *desiderata* have been met is told in a critical and yet judicially fair way by Lequeux.

With regard to the doses and technique of the administration of the scopolamine-morphine the conclusion is formed that it is a delicate procedure, requiring prudence and constant watching, and that it ought therefore to be employed only in hospital; that the right dose is difficult of establishment, its usefulness being based on the antagonism of the two drugs which compose it, and which may not completely neutralise one another; and that the morphine is perhaps more to be feared, but that the scopolamine alone may cause danger. A perfectly safe dose may not produce the desired effect, whilst an adequate one may introduce risks. Whilst it has been employed in all sorts of cases, in normal or

morbid labours, in spontaneous or instrumental confinements, with healthy women and with women suffering from the most grave disorders of pregnancy, there is now a marked tendency to restrict its use to healthy women suffering from no cardiac, pulmonary, or renal lesions, and with the single and essential object of lessening the intensity of labour pains by the production of *demi-sommeil*. When we compare, therefore, scopolamine-morphine with chloroform we must at once recognise that the range of applicability of the former is markedly restricted.

In its general action on the woman in labour scopolamine-morphine has been found to exhibit certain smaller inconveniences, such as dryness of the skin and mucous membranes, diminution in the glandular secretions, more or less marked mydriasis, and some quickening and excitement of the pulse. More serious symptoms have been met with, such as delirium, disordered heart action, and more or less marked signs of asphyxia. Individuals react unequally to the drugs, and unexpected idiosyncrasies are met with. Elaborate observations have been made on the local effects of the scopolamine method, and the results are not easy of summation. It is difficult to understand the optimism of a few enthusiasts in view of the experiences of others, and even of their own. For instance, one observer is absolutely satisfied, but admits one maternal death and eleven infantile ones. Many think that it only lessens pain imperfectly, and that the patient is not so much saved from suffering as prevented from remembering it. As one writer puts it — "*la femme accouche comme dans un délire.*" But a more serious criticism is that the uterine contractions are unfavourably affected, and that the action of the abdominal muscles is partially or completely arrested. Thus the second stage is apt to be prolonged, and Hocheisen speaks of the fetal head resting for several hours on the vulva, and of the patient making great efforts without the abdominal muscles showing any response. It seemed to him as if the innervation of the parts was disturbed; to him the scopolamine method seemed to be not humane. The result is that all sorts of attempts have to be made to extract the head, and that inertia of the uterus and all its unfavourable sequelæ, such as post-partum hæmorrhage, are to be feared. It seems, however, to have no ill effects on the puerperium and on lactation. It is when inquiry comes to be made into the action of the anæsthetic agent upon the fetus that its full danger is made manifest. At the best, and even if one adopts various explanations and qualifying circumstances, the results as regards the infants cannot be called reassuring. A considerable number of the babies are born in a state of torpor, or what has been called oligopnoic sleep: some exhibit no respiratory movements for several minutes. Asphyxia is very frequent, and the infants are then resuscitated, sometimes with more and sometimes with less ease. The reports of nearly all observers contain fetal mortality. It is true

that the infantile deaths may be explained away as due to the delay in labour and the instrumental means employed, but the question may be fairly asked whether these circumstances, in their turn, have not been caused by the scopolamine-morphine method.

Another aspect of the subject calls for comment, viz. the use of the scopolamine-morphine method in combination with other anæsthetics. Various associations have been made—thus it has been used with chloroform, with ether, with chloroform and ether, and with veronal; and it has been urged in support of the scopolamine method that if in any case of confinement it became necessary to induce anæsthesia by inhalation (chloroform or ether), the previous injection of the scopolamine and morphine did not have any evil consequences, and did not prevent recourse being had to general anæsthesia. When, however, one remembers how free from risk chloroform and ether have proved themselves to be in obstetric practice on account of the special circumstances (circulatory, respiratory, and psychical) of a confinement case, it seems a most unnecessary procedure to anticipate the giving of the chloroform by the injection of the hyoscine and morphine. Further, all authorities, even those who speak most warmly of the *demi-sommeil* method, admit the existence of contra-indications. Thus circulatory disturbances, such as uncompensated valvular lesions with rapid pulse and arrhythmia, grave pulmonary affections, the febrile state, general feebleness, renal affections (*e.g.* eclampsia), acute anæmia, weakness of the uterine contractions, and a tendency to hæmorrhages, and especially to placenta prævia, have all been named.

When one puts together all the facts that have been named, the impression deepens that scopolamine-morphine narcosis does not present the profession with an anæsthetic method in labour superior to chloroform or ether inhalations: and that conclusion is reached without invoking the additional argument of the facility with which inhalation can be begun when needed and suspended when the necessity has passed, as contrasted with the fact that when once the scopolamine-morphine has been injected, its effect is produced whether or not the labour progresses in the desired manner and at the anticipated rate.

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## NEW BOOKS AND NEW EDITIONS.

*The Physiology of Reproduction.* By FRANCIS H. A. MARSHALL, M.A. (Cantab.), D.Sc.(Edin.), &c., with a Preface by Professor E. A. SCHAFER, and Contributions by WILLIAM CRAMER, Ph.D., D.Sc., and JAMES LOCHHEAD, M.A., M.D., &c. London: Longmans Green & Co. Price 21s. net.

THIS is a markedly able work, and one that will be welcomed by physiologists and obstetricians. The author not only displays an

accurate and extensive knowledge of the subject, but in some of its aspects the original work he has done and included in it increases the value of several of the chapters.

Chapters X. and XI. on Fœtal Nutrition, the Placenta, and the Changes in the Maternal Organism during Pregnancy are contributed by Dr. James Lochhead, and Chapter VIII. on the Biochemistry of the Sexual Organs by Dr. W. Cramer. These are very difficult subjects to treat of, and the author has greatly enhanced the utility of the book by entrusting these parts of his subject to two investigators so competent to deal with them.

One turns naturally to the chapters on Menstruation. Human menstruation has had great light thrown on it by the comparative work of Heape, and by that of the author in co-operation with Jolly, so that the result of the description is to give one a clearer account of this complex function and its relation to its forerunners in lower mammals. The essential similarity between the menstrual cycle in the primates and the œstrous cycle in the lower mammalia is clearly established, as well as the equivalence of the pro-œstrum in the last to the menstrual cycle in women.

The facts as to the corpus luteum are thoroughly discussed, and the anatomy and functions of the reproductive organs well and accurately given.

So many disputed and disputable points are raised in many of the subjects described that one, if tempted to discuss them, could go far beyond the ordinary space allowed. Thus the factors determining sex are carefully considered, but all that is said on this only leaves one as much in the dark as ever, the only gleam of light being the evident failure of the route of the solution *via* the chromosomes to clear up the matter.

In the biochemistry of the sexual organs Dr. Cramer has described simply and clearly many facts of great value, and put the whole matter not too technically. A non-expert on this subject soon gets beyond his depth in any attempt to get knowledge from ordinary sources, and the account given here is therefore specially valuable to him.

Lochhead's contribution is a very fine one, especially in the description of fœtal nutrition. Such an account is of the greatest value to the obstetric student and teacher, and should do much to clarify obstetric teaching on a much neglected subject.

The only unsatisfactory part is that dealing with spermatogenesis and oogenesis. The author is here one-sided, merely considering the views of one school, and that a slowly dying one. The view that the germ- or sperm-epithelium gives rise to the primitive sex-cells assumes that their source is to be found within the limits of the sex glands, in view, however, of the fact that in fishes, birds, and mammals the



primitive ova are found in the developing embryo *en route* for the sexual gland, another striking explanation must be considered. The recent work of Allen, King, and especially of Rubaschkin, along with that of Boveri, gives us a theory of the early zygotic origin of the sex cells which really helps heredity. The statement at page 124 to the effect that "the ova, the follicular epithelial cells, and most probably also the interstitial cells, are all derived from the germinal epithelium" is most inadequate in view of what we now know of early embryology and of heredity and its unit-characters. The orthodox explanation makes no distinction between a sex-cell and a somatic one. When Waldeyer in 1870 gave his view of the origin of the primitive ova no other one was possible, and the simple basis in it of mere juxtaposition of sex-cell to germ epithelial cell, has had a fatal fascination in human anatomy. Waldeyer, however, in Hertwig's *Handbuch der Entwicklungslehre* (1906), says distinctly (i. 160):—

"Mehr und mehr häufen sich in den beiden letzten Jahrzehnten Befunde welche dafür sprechen dass die Geschlechtszellen, wie wir die Spermien und die Eier-einschliesslich ihrer Vorstufen—im allgemeinen bezeichnet haben, eine besondere Art von Zellen darstellen, die bereits in den ersten Stadien der Furchung auftreten, sich von den übrigen Zellen, die sonstigen Teile des neuen Individuums, insbesondere dessen Gewebe bilden, den somatischen oder Körperzellen, alsbald sondern und in ununterbrochener Vermehrungsfolge den sämtlichen Spermien oder Eiern eines männlichen bez. weiblichen Individuums zur entwicklungsgeschichtlichen Grundlage dienen."

The statement at page 122 that "both follicle cells and interstitial cells are . . . still potential ova" is quite out of touch with modern work. It may seem ungracious to write thus of one part of such an outstanding and able book where the author, more than any other, has investigated intricate points, read largely, and thought deeply, but it is done in the hope that in a new edition, which should come soon, he will reconsider his views in the same broad and fairminded spirit so prominent in the other parts of the present book.

The whole work has great literary merits, and the quotations at the head of each chapter are apposite. The aphorism of Matthews Duncan at page 75 the reviewer heard in the form, "Menstruation is like the red flag at the auction-room door, showing there is something more important going on inside."

The book is appropriately dedicated to Mr. Heape, and there is a short commendatory preface by Professor Schäfer, so that this most promising *débutant* has good sponsors.

*A Manual of Gynecology.* By THOMAS WATTS EDEN, M.D.(Edin.), F.R.C.P.(Lond.), F.R.C.S.(Edin.). With 272 Illustrations in the Text. Pp. 632. London: J. & A. Churchill. 1911. Price 18s.

THE author presents this as a complete manual for students and general practitioners.

As such it fulfils the purpose for which it is presented fairly well. It has been planned rather upon clinical and practical relationships, and does not pretend to enter exhaustively into the pathology of the various conditions.

As far as it goes the most recent advances in research are incorporated, and we are glad to see that the author is inclined towards the most recent views on endometritis; and although for teaching purposes the classification of Ruge is useful and is still retained in this manual, the author recognises that revisal of classification must follow recent investigations on this subject.

We do not agree that hernia of the ovary is usually an acquired condition, nor that hysterectomy with conservation of the ovaries leads to an artificial menopause, nor do we agree that vaginofixation if properly carried out in suitable cases is less favourable in its results than ventrifixation.

We think that in any text-book of gynecology the urinary organs should be at least referred to. No mention is made of cystitis, an omission which, from the practical point of view, is a glaring one. In describing the method of treating perineal rupture by operation, no mention is made of the importance of the levatores ani in all but slight cases.

In spite of the above criticism the manual is an excellent one. The context is clear and very readable.

The method of arrangement is much the same as that adopted in most books of its kind.

It gives a concise and clear résumé of the subject, and cannot fail to be appreciated by the student.

# GENERAL INDEX.

A	PAGE	PAGE
Aderopis, vagine diffusum. By D. Berry Hart . . .	577	
ANDERSON, A. G., ASHLEY W. MACKINTOSH, and A. W. FALCONER, Congenital family chloroma . . .	191	
ANDERSON, JOSEPH, Sir James Young Simpson's work in archaeology . . .	516	
ARTERIAL pathology, Sir James Young Simpson's contributions to. By J. W. Ballantyne . . .	551	
Archæology, Sir James Young Simpson's work in. By Joseph Anderson . . .	516	
Arterial pressure. By G. A. Gibson . . .	197	
B		
BALLANTYNE, J. W., Sir James Young Simpson's contributions to arterial pathology . . .	551	
BARBOUR, A. H. FREELAND, Simpson as gynecologist . . .	534	
BAYNE, JOSEPH, Outbreak of typhus fever in the city of Carlisle . . .	410	
BROCK, ARTHUR J., "Ergotherapy" in neurasthenia . . .	430	
C		
CAIRD, F. M., Epithelioma of the tongue, A review of sixty hospital cases . . .	5	
CAIRD, F. M., Introduction to a discussion on duodenal ulcer . . .	318	
CHLOROMA, Congenital family. By Ashley W. Mackintosh, A. W. Falconer, and A. G. Anderson . . .	101	
Clinical Records—		
CARMICHAEL, E. SCOTT, Acute dilatation of the stomach as a post-operative complication in abdominal cases . . .	438	
DOWDEN, J. W., Case of acute gangrene of the cæcum, ascending, transverse, and descending colon . . .	435	
FOGGIE, W. E., Case of pulmonary tuberculosis with whole lung as one cavity . . .	339	
HAULTAIN, F. W. N., A case of adenoma of the vagina . . .	600	
MILES, ALEXANDER, On massage of the heart in cardiac arrest during anesthesia . . .		52
MILLER, A. G., Treatment of residual urine in connection with enlarged prostate . . .		254
THOMSON, ALEXIS, Impaction of calculus at the vesical end of each ureter . . .		337
WALLACE, DAVID, Epithelioma of the upper end of the œsophagus . . .		338
WHYTE, G. DUNNAN, Case of a foreign body introduced into the rectum . . .		255
WILKIE, D. P. D., Case of implantation of the omentum in the abdominal wall for hepatic cirrhosis with ascites . . .		257
CROOM, Sir HALLIDAY, Sir James Simpson's influence on the progress of obstetrics . . .		523
D		
DOX, ALEXANDER, Some operative procedures about the knee-joint . . .		114
DUNDAS, JAMES, A national medical service . . .		311
Duodenal ulcer, A discussion on. Introduction by F. M. Caird . . .		318
Duodenal ulcer, Retrograde venous embolism as a cause of acute gastric and. By D. P. D. Wilkie . . .		391
E		
Eclampsia originating in the puerperium. By R. W. Johnstone . . .		591
Editorial Notes and News:—		
Colonel Warburton's Resignation—The late Dr. Colin Mackenzie—The Crisis in the Medical Profession—The Scottish Otological and Laryngological Society—Appointments . . .		1
Physiological Research in Relation to Surgery—Medical Fees—Vital Statistics for London, 1900—Sir David McNeill . . .		97
Presentation of Portrait to Emeritus-Professor Chiene, C.B.—Presentation to Dr.		

	PAGE		PAGE
William Craig—Royal Medical Society—The Morningside Report—The Price of a Pound of Flesh—Appointments . . . . .	193	JOHNSTONE, R. W., Eclampsia originating in the puerperium . . . . .	591
Open-air Schools—The late Dr. Andrew Smart—The late Dr. George Henderson—Professors and Examinations—Medicine and the State—The International Congress . . . . .	289		
Royal Infirmary Report—The New Superintendent of the Royal Infirmary—The Treatment of Incipient Insanity—Tuberculosis in Aberdeen—The Scots Douche . . . . .	385	K	
Epithelioma of the tongue. By F. M. Caird . . . . .	5	Knee-joint, Some operative procedures about the. By Alexander Don . . . . .	114
"Ergotherapy" in neurasthenia. By Arthur J. Brock . . . . .	430		
Erythraemia; with notes on two cases. By H. L. Watson-Wemyss . . . . .	129	L	
Examination of employees, The medical. By H. G. Langwill . . . . .	302	LANGWILL, H. G., The medical examination of employees . . . . .	302
		Life and its Epiphanies. By Sir Alex. R. Simpson . . . . .	561
F		Low, R. CRANSTON, Fungus infections of the finger-nails . . . . .	121
FALCONER, A. W., ASHLEY W. MACKINTOSH, and A. G. ANDERSON, Congenital family cholæmia . . . . .	101	Lupus carcinoma, On the treatment of. By Norman Walker . . . . .	295
Fungus infections of the finger-nails. By R. Cranston Low . . . . .	121	Lymphatic glands, Some conditions associated with enlargement of. By Charles H. Melland . . . . .	156
G		M	
GIBSON, G. A., Arterial pressure . . . . .	197	MACKINTOSH, ASHLEY W., A. W. FALCONER, and A. G. ANDERSON, Congenital family cholæmia . . . . .	101
GREIG, DAVID M., Congenital high scapula . . . . .	242	MARSHALL, Major D. G., Tropical diseases seen in Edinburgh during 1910 . . . . .	103
GREIG, DAVID M., On recurrent enlargement of the salivary glands . . . . .	38	MATTHEW, EDWIN, Iodides in high blood-pressure and arteriosclerosis . . . . .	228
Gynecologist, Simpson as. By A. H. Freeland Barbour . . . . .	534	Medical examination of employees, The. By H. G. Langwill . . . . .	302
		MELLAND, CHARLES H., Some conditions associated with enlargement of lymphatic glands . . . . .	156
H		Memories of Sir James Simpson. By Sir Alex. R. Simpson . . . . .	191
HART, D. BERRY, Adenoma vaginæ diffusum . . . . .	577	Midwifery and gynecology, A retrospect and comparison of the progress of. By F. W. N. Haultain . . . . .	17
HART, D. BERRY, James Young Simpson . . . . .	543		
HAULTAIN, F. W. N., A retrospect and comparison of the progress of midwifery and gynecology . . . . .	17	N	
Heredity as a causative factor in disease. By G. M. C. Smith . . . . .	122	National medical service, A. By James Dundas . . . . .	311
High scapula, Congenital. By David M. Greig . . . . .	242	Neurasthenia, "Ergotherapy" in. By Arthur J. Brock . . . . .	430
I		O	
Iodides in high blood-pressure and arteriosclerosis. By Edwin Matthew . . . . .	228	Obstetrics, Sir James Simpson's influence on the progress of. By Sir Halliday Croom . . . . .	523
		Operative procedures about the knee-joint, Some. By Alexander Don . . . . .	114



## R

	PAGE
Royal College of Physicians of Edinburgh; Royal College of Surgeons, Edinburgh; Royal Faculty of Physicians and Surgeons of Glasgow; List of Passes . . . . .	441

## S

Salivary glands, On recurrent enlargement of the. By David M. Greig . . . . .	38
SIMPSON, Sir ALEX. R., Life and its Epiphanies . . . . .	561
SIMPSON, Sir ALEX. R., Memories of Sir James Simpson . . . . .	491
Simpson's contributions to antenatal pathology, Sir James Y. By J. W. Ballantyne . . . . .	554
SIMPSON, EVE BLANTYRE, Sir James Y. Simpson . . . . .	482
Simpson as gynecologist. By A. H. Freeland Barbour . . . . .	534
Simpson's influence on the progress of obstetrics, Sir James. By Sir Halliday Croom . . . . .	523
Simpson, Sir James Y. By Eve Blantyre Simpson . . . . .	482
Simpson, James Young. By D. Berry Hart . . . . .	543
Simpson, Sir James, Memoirs of. By Sir Alex. R. Simpson . . . . .	491

## PAGE

Simpson's work in archæology, Sir James. By Joseph Anderson . . . . .	516
SMITH, G. M. C., Heredity as a causative factor in disease . . . . .	422
Societies, Meetings of— Edinburgh Medico-Chirurgical Society . . . . .	54, 165, 259
Edinburgh Obstetrical Society . . . . .	56, 260, 442, 601
Fortfarshire Medical Association . . . . .	342

## T

Tropical diseases. By Major D. G. Marshall . . . . .	403
Typhus fever in the City of Carlisle, Outbreak of. By Joseph Beard . . . . .	410

## V

Venous embolism as a cause of acute gastric and duodenal ulcer, Retrograde. By D. P. D. Wilkie . . . . .	391
--	-----

## W

WALKER, NORMAN, On the treatment of lupus carcinoma . . . . .	295
WATSON-WEMYSS, H. L., Erythremia; with notes on two cases . . . . .	129
WILKIE, D. P. D., Retrograde venous embolism as a cause of acute gastric and duodenal ulcer . . . . .	391

# CRITICAL SUMMARIES AND ABSTRACTS OF RECENT LITERATURE.

## Dermatology.

	PAGE
W. Allan Jamieson and R. Cranston	
Low . . . . .	181, 465

## Diseases of Children.

A. Dingwall Fordyce . . . . .	171
G. H. Melville Dunlop . . . . .	453

## Diseases of the Throat, Nose, and Ear.

J. S. Fraser . . . . .	75
A. Logan Turner and W. G. Porter . . . . .	363

## Infectious Diseases.

Claude Ker . . . . .	358
----------------------	-----

## Medical Jurisprudence.

Harvey Littlejohn and J. H. Harvey	
Pirie . . . . .	71

## Medicine.

J. D. Comrie . . . . .	346
J. S. Fowler . . . . .	59, 262, 443

## Mental Diseases.

	PAGE
Douglas MacRae . . . . .	175

## Obstetrics and Gynecology.

A. H. F. Barbour and B. P. Watson . . . . .	66, 353
J. W. Ballantyne . . . . .	269, 602

## Ophthalmology.

W. G. Sym . . . . .	458
A. MacGillivray . . . . .	278

## Pathology.

T. Shennan . . . . .	274
----------------------	-----

## Surgery.

George Chiene . . . . .	165, 264
Jas. M. Graham . . . . .	352, 451, 452
Jas. Lochhead . . . . .	65, 167, 168, 170, 351, 352, 448, 450
J. W. Struthers . . . . .	163, 61, 268, 269
D. P. D. Wilkie . . . . .	349, 449

## Therapeutics.

F. Charteris . . . . .	281
------------------------	-----

## REVIEWS OF BOOKS.

	PAGE		PAGE
Air-Swallowing. By Dr. Mauban	382	Fractures and their Treatment.	
Anæmia. By Drs. A. Lazarus		By J. Hogarth Pringle	374
and O. Naegeli	190	Fractures par le Massage et la	
Anatomy, Atlas of Pathological.		Mobilisation, Précis du Traite-	
By Professors Kast, Fraenkel,		ment des. By Dr. Lucas-Cham-	
and Rumpel	81	pionniere	86
Anatomy, Manual of Practical.		Genito-Urinary and Venereal	
By the late D. J. Cunningham	377	Diseases. By J. William	
Arteres de l'abdomen, Recher-		White	379
ches d'anatomie chirurgicale		Gynecology, Text-Book on the	
sur lest Le tronc coeliaque.		Practice of. 4th Ed. By W.	
Par Pierre Descomps	382	Easterly Ashton	96
Cancer Problem, The. By C. E.		Gynecology, A Manual of. By	
Green	191	Thomas Watts Eden	608
Chemistry, Laboratory Notes on		Gynecology, The Principles of.	
Organic. By Paul Haas	93	By W. Blair Bell	375
Chemistry, A Manual of Practical		Hæmoglobinuria. By Ambrose	
Inorganic. By A. M. Kellas	370	E. L. Charpentier	380
Chemistry, A Manual of Practical		Hay Fever and Paroxysmal Sneez-	
Organic. By A. M. Kellas	370	ing. By Eugene S. Yonge	474
Children, Diseases of. By Abra-		Health in West Africa, A Guide	
ham Jacobi	95	to the Preservation of. By	
Children: A Märchen. By Hugo		Henry Strachan	478
Salus	480	Hernia: Its Cause and Treat-	
Children, Mentally Deficient. By		ment. By R. W. Murray	477
G. E. Shuttleworth and W. A.		Hernie Inguinale, La Cure Radi-	
Potts	188	cale de la. By Dr. Lucas-Cham-	
Clinical Pathology in Practice.		pionniere	85
By Thomas J. Horder	368	Histology, The Essentials of.	
Dawn of the Health Age, The.		By E. A. Schafer	93
By Benjamin Moore	367	Histology, Normal. By G. A.	
Dermatology, Index of the British		Piersol	381
Journal of, 1888-1909	381	Hydrotherapy. By Guy Hins-	
Diseases of Women, Manual of.		dale	188
By W. E. Fothergill	92	Hygiene of Infancy and Child-	
Dislocations and Joint Fractures.		hood, The. By A. Dingwall	
By F. Jay Cotton	87	Fordyce	187
Electricity and Röntgen Rays,		Infancy and Childhood, The	
Medical. By Sinclair Tousey	371	Hygiene of. By A. Dingwall	
Elementary Bandaging and Sur-		Fordyce	187
gical Dressing, Pye's	379	Infant, Nutrition of the. 3rd Ed.	
Éléments d'anatomie patholo-		By Ralph Vincent	96
gique. By Dr. L. Beriel	82	Infants and Young Children in	
Endocrinologie. By Drs. Léo-		Health, The Care of. By Mil-	
pold-Lévi and Henri de Roths-		dred M. Burgess	478
child	382	Internal Medicine, Diagnostics	
Evolution and Heredity, Phases		of. By Glensworth Reeve	
of. By David Berry Hart	80	Butler	378
Food and Hygiene. 2nd Ed. By		Intestinal Surgery, Handbook of.	
William Tibbles	95	By L. A. Bidwell	380

	PAGE		PAGE
Kidney, Movable. By William Billington . . . . .	477	Pharmacopœia, The Extra. By Martindale and Westcott . . . . .	380
Laboratory Notes on Organic Chemistry. By Paul Haas . . . . .	93	Pharmacology and Therapeutics. By Arthur Cushny . . . . .	192
L'aérophagie. By Dr. Mauban . . . . .	382	Pharmacy, Materia Medica, and Therapeutics, Elements of. 9th Ed. By Sir William Whitla . . . . .	96
Malaria in India, Prophylaxis of. By Lieut.-Colonel P. Hehir . . . . .	286	Physical Examination and Diagnostic Anatomy. By Chas. B. Slade . . . . .	95
Massage et la Mobilisation, Précis du Traitement des Fractures par le. By Dr. Lucas-Championniere . . . . .	86	Physiological Principles in Treatment. 2nd Ed. By W. Langdon Brown . . . . .	94
Medicine, Diagnostics of Internal. By Glentworth Reeve Butler . . . . .	378	Physiology, Notes on. 8th Ed. By Henry Ashby . . . . .	95
Medicine, History of. By Max Neuburger . . . . .	378	Physiology of Reproduction, The. By Francis H. A. Marshall . . . . .	605
Mental Diseases, Diseases of the Brain and. Vol. VIII. of a "System of Medicine." By Sir Clifford Allbutt and H. D. Rolleston . . . . .	284	Rhinology and Laryngology, Hints for the General Practitioner on. By Johann Fein . . . . .	372
Mentally Deficient Children. By G. E. Shuttleworth and W. A. Potts . . . . .	188	Serum and Vaccine Therapy. By Professor R. T. Hewlett . . . . .	478
Metabolism and Nutrition, Clinical Treatises on the Pathology and Therapy of Disorders of. By Professor Carl v. Noorden . . . . .	478	Sexual Disabilities of Man, The. By Arthur Cooper . . . . .	380
Microscopic Diagnosis, Aids to. By E. Blake Knox . . . . .	94	Ship-Surgeon's Handbook, The. By A. Vavasour Elder . . . . .	377
Middlesex Hospital, Archives of the. Vol. XIX. . . . .	84	Spinal Cord, Diseases of the. By R. T. Williamson . . . . .	473
Mind, Unsoundness of. By T. S. Clouston . . . . .	470	Sprains and Allied Injuries of Joints. By R. H. Anglin White-locke . . . . .	87
Motherhood, Practical. By Helen V. Campbell . . . . .	285	Squire's Pocket Companion . . . . .	96
Nervous Diseases, Text-Book of. By Professor H. Oppenheim . . . . .	472	St. Thomas's Hospital Reports. Vol. XXXVII. Edited by Dr. H. G. Turney and Mr. W. H. Battle . . . . .	93
Nose, Mouth, Pharynx and Larynx, The Diseases of the. By Alfred Bruck . . . . .	191	Stomach and Intestines, Diseases of the. By Robert Coleman Kemp . . . . .	474
Nursing for Male Nurses, Practical. By E. M. and A. R. Hassard . . . . .	381	Surgery of Childhood, The. By De Forrest Willard . . . . .	475
Nutrition of the Infant. 3rd Ed. By Ralph Vincent . . . . .	96	Surgery of Children, A Handbook of. By Professor E. Kirmisson . . . . .	373
Obstetrics, Practical. By E. Hastings Tweedy and G. T. Wrench . . . . .	91	Surgery, The Fourth Era in. By Robert T. Morris . . . . .	477
Ophthalmic Practice, Golden Rules of. By Gustavus Hartridge . . . . .	479	Surgery, Modern. By J. Chalmers Da Costa . . . . .	379
Ophthalmic Surgery. By Charles H. Beard . . . . .	185	Surgery, Urgent. By Felix Lejars . . . . .	88
Pancreas, Disease of the. By Eugene L. Opie . . . . .	369	Surgical After-Treatment. By L. R. G. Crandon . . . . .	89
Pathological Anatomy, Atlas of. By Professors Kast, Fraenkel, and Rumpel . . . . .	81	Surgical Anatomy, Manual of. By Charles R. Whittaker . . . . .	480
Pathology, A Text-Book of. By Joseph M'Farland . . . . .	83	Thérapeutique usuelle du praticien. By Albert Robin . . . . .	479



	PAGE		PAGE
Transactions of the College of Physicians of Philadelphia . . .	94	Urgent Surgery. By Felix Lejars . . .	88
Tropical Medicine and Hygiene. Part II. By C. W. Daniels . . .	287	Urine Examination made Easy. By T. Carruthers . . .	480
Truncus aëliaque, Le: Recherches d'anatomie chirurgicale sur les artères de l'abdomen. Par Pierre Descamps . . .	382	Vaccine Therapy: Its Administration, Value and Limitations. By Sir Almroth E. Wright . .	472
Typhoid Fever and the Other Exanthemata. By H. A. Hare and E. J. G. Beardsley . . .	489	Women, Conversations with. By A. Rabagliati . . .	90
		Wounds in War. By Colonel W. F. Stevenson . . .	276
		Zoology, Outlines of. By J. Arthur Thomson . . .	287

## LIST OF ILLUSTRATIONS.

Progress of Midwifery and Gynecology	PAGE
1 <i>Chart</i> . . . . .	37
Operative Procedures about the Knee-Joint	
1 <i>Radiogram</i> . . . . .	118
Fungus Infections of the Finger-Nails	
6 <i>Plates</i> . . . . .	124
Erythremia—	
3 <i>Figs. (coloured)</i> . . . . .	136
Enlargement of Lymphatic Glands	
3 <i>Charts</i> . . . . .	156
Iodides in Blood-Pressure	
6 <i>Charts</i> . . . . .	228
Congenital High Scapula	
6 <i>Figs.</i> . . . . .	242
On the Treatment of Lupus Carcinoma	
10 <i>Figs.</i> . . . . .	295
Impaction of Calculus at the Vesical End of each Ureter—	
1 <i>Sketches</i> . . . . .	337
Pulmonary Tuberculosis with whole Lung as one Clot—	
<i>Supermicroscopic Photograph</i> . . . . .	339
Retrograde Venous Embolism as a Cause of Acute Gastric and Duodenal Ulcer—	
7 <i>Plates (coloured)</i> . . . . .	391
Tropical Diseases seen in Edinburgh during 1910—	
2 <i>Figs</i> . . . . .	403
Sir James Young Simpson	
3 <i>Plates</i> . . . . .	481
Adenoma Vaginae Diffusum	
7 <i>Figs</i> . . . . .	577
Adenoma of the Vagina—	
1 <i>Plate</i> . . . . .	600



## LIST OF ILLUSTRATIONS.

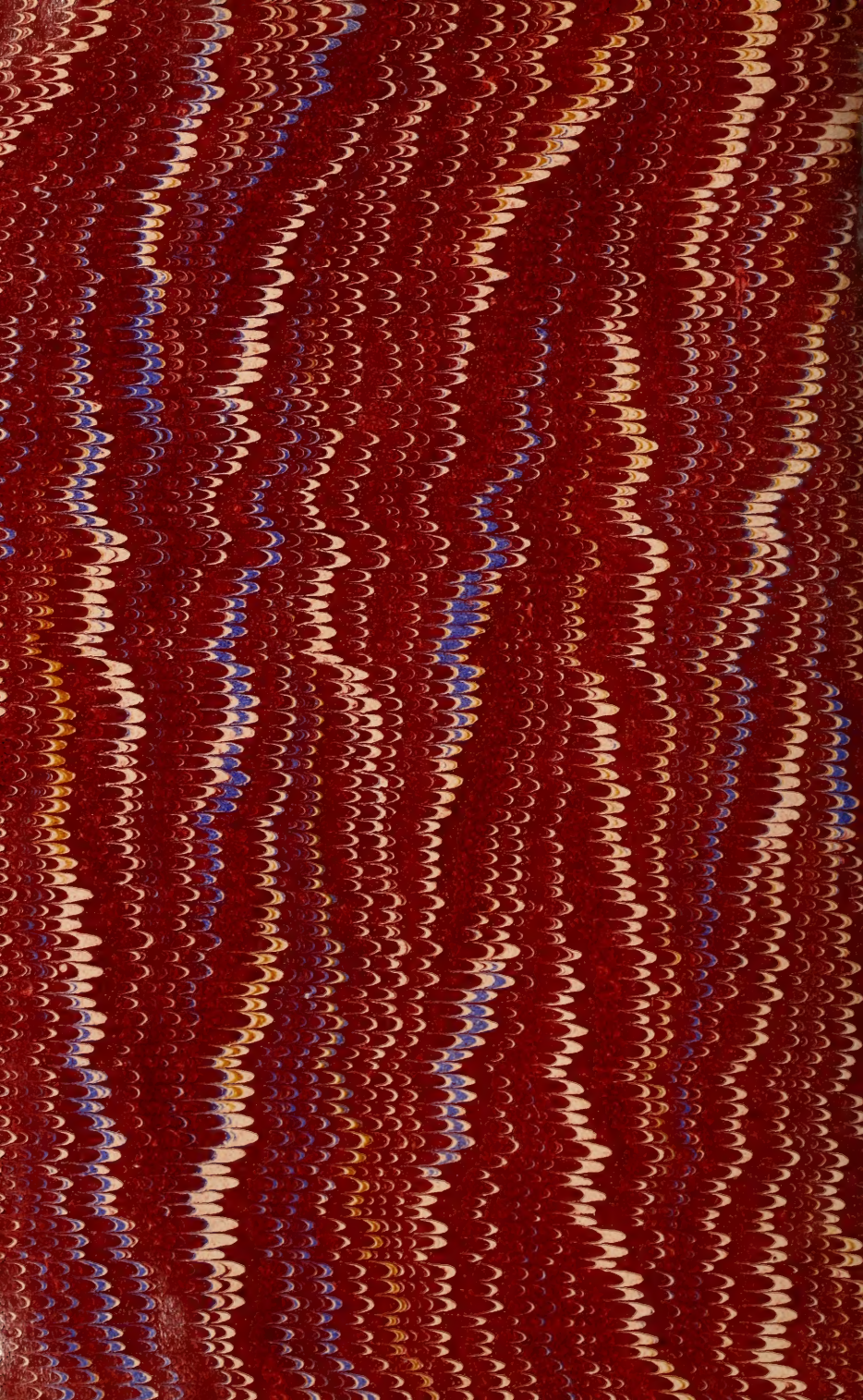
Progress of Midwifery and Gynecology	pass
1 <i>Chart</i> . . . . .	37
Operative Procedures about the Knee-Joint	
1 <i>Diagram</i> . . . . .	118
Fungus Infections of the Finger-Nails	
6 <i>Plates</i> . . . . .	124
Erythremia	
3 <i>Figs. (coloured)</i> . . . . .	136
Enlargement of Lymphatic Glands	
3 <i>Charts</i> . . . . .	156
Iodides in Blood-Pressure	
6 <i>Charts</i> . . . . .	228
Congenital High Scapula	
6 <i>Figs.</i> . . . . .	242
On the Treatment of Lupus Carcinoma	
10 <i>Figs.</i> . . . . .	295
Impaction of Calculus at the Vesical End of each Ureter	
1 <i>Sketch</i> . . . . .	337
Pulmonary Tuberculosis with whole Lung as one Cavity—	
<i>Stereoscopic Photograph</i> . . . . .	339
Retrograde Venous Embolism as a Cause of Acute Gastric and Duodenal Ulcer	
7 <i>Plates (6 coloured)</i> . . . . .	391
Tropical Diseases seen in Edinburgh during 1910—	
2 <i>Figs.</i> . . . . .	402
Sir James Young Simpson	
9 <i>Plates</i> . . . . .	481
Adenoma of Vagina—Diffuse	
7 <i>Figs.</i> . . . . .	577
Adenoma of the Vagina	
1 <i>Plate</i> . . . . .	600













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